

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Thomas G. Xydis
Appl. No. : 09/997,299
Filed : November 29, 2001
Title : SECURITY TOKEN AND ACCESS POINT NETWORKING

Grp./A.U. : 2135
Examiner : Ponnoreay Pich

Docket No. : 65,116-038

BRIEF ON APPEAL

Mail Stop Appeal Brief - Patents
Commissioner of Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

Subsequent to the filing of the Notice of Appeal on April 4, 2007, Applicant now submits a brief in support of the appeal in response to the Final Rejection set forth in the Office Action dated October 5, 2007. Only a single copy of this Appeal Brief is being submitted in accordance with 37 C.F.R. §41.37 and this Appeal Brief is accompanied by the required fee under §41.20(b)(2).

Real Party in Interest

The inventor assigned this application to Ensure Technologies, Inc. as evidenced by an assignment recorded at reel 012341, frame 0033.

Related Appeals and Interferences

A notice of appeal has been filed in a related case, United States Patent Application Serial No. 10/948,497, which is continuation-in-part of the subject application.

Status of Claims

Claims 1-10 are attached hereto in the appendix. Claims 1, 2, 4-12, and 14-15 stand finally rejected under 35 U.S.C. §103(a) and are the subject of this appeal.

Status of Amendments

All amendments have been entered and are reflected in the claims in the Appendix.

Summary of Claimed Subject Matter

Claim 1 recites a method of securing access to a network 13 as described in paragraphs [0016] and [0017] of the specification and the figures as originally filed. The network 13 includes at least one first electronic device 18 and at least one access point 20. The first electronic device 18 is described in paragraph [0020] as including, but not limited to, computers, printers, PDA's, copy machines, cellular phones, or other electronic device found in a working space 14. Access points, as described in paragraph [0018], are well known connections to a network. The claimed invention secures the network 13 from a user 16 having a second electronic device 12, as described in paragraph [0019], which includes a token, a card, a badge, or other identification carried by the user 16 to verify his identity.

The method of claim 1 comprises the steps of transmitting a radio frequency (RF) signal 48 from the at least one first electronic device 18 and detecting the RF signal 48 from

the at least one first electronic device 18 with the at least one access point 20, which is described at paragraph [0021]. Referring to paragraph [0022], claim 1 further recites transmitting a radio frequency (RF) signal 50 from the second electronic device 12 including user information to identify the user 16 and detecting the RF signal 50 from the second electronic device 12 with the same at least one access point 20. Next, as set forth in paragraphs [0023] and [0024], user privileges are retrieved for the user 16 from a user database based upon the user information and the at least one first electronic device 18 is enabled to allow the user 16 having the second electronic device 12 to access the network 13 and the at least one first electronic device 18 in response to the at least one access point 20 detecting the RF signals 48, 50 from both the at least one first 18 and the second electronic devices 12 and based upon the user privileges.

The at least one first electronic device 18 is disabled in response to either of the RF signals 48, 50 from the at least one first and second electronic devices 18, 12 no longer being detected by the at least one access point 20 to prevent access to the network 13 and the first electronic device 18, as described in paragraph [0027]. With reference to paragraph [0030], the at least one first electronic device 18 is re-enabled in response to the at least one access point 20 detecting the RF signals 48, 50 from the at least one first 18 and the second electronic devices 12 based upon the user privileges.

Claim 10 recites a method of securing access to a network 13, as described in paragraphs [0016] and [0017] of the specification and the figures as originally filed. The network 13 includes at least one first electronic device 18 and at least one access point 20. The first electronic device 18 is described in paragraph [0020] as including, but not limited

to, computers, printers, PDA's, copy machines, cellular phones, or other electronic device found in a working space 14. Access points, as described in paragraph [0018], are well known connections to a network. The claimed invention secures the network 13 from a user 16 having a second electronic device 12, as described in paragraph [0019], which includes a token, a card, a badge, or other identification carried by the user 16 to verify his identity.

The method of claim 10 comprises the step of transmitting a radio frequency (RF) signal 50 from the second electronic device 12 including user information to identify the user 16 to establish communication with at least one access point 20, as set forth in paragraph [0022]. Referring to paragraph [0032], claim 10 recites detecting the RF signal 50 from the second electronic device 12 with a first 21 and a second access points 23, measuring the strength of the RF signal 50 from the second electronic device 12 at the first and second access points 21, 23, and comparing a maximum measured RF signal 50 strength by either of the first and second access points 21, 23 to a predetermined threshold.

User privileges for the user 16 are retrieved from a user database based upon the user information as described in paragraph [0024]. Referring again to paragraphs [0032] and [0024], a predetermined number of at least one first electronic devices 18 are enabled in response to the detected RF signal 50 strength being above the predetermined threshold and based upon the user privileges to allow access to the network 13 and the at least one first electronic device 18. Data from the second electronic device 12 is transmitted through the at least one access point 20 which measures the maximum RF signal 50 strength to the predetermined number of at least one first electronic devices 18 thereby establishing communication between the at least one first electronic devices 18 and the second electronic device 12, as specified in paragraphs [0033] and [0034].

Referring now to paragraphs [0027] and [0035], the at least one first electronic devices 18 is disabled in response to the RF signal 50 strength from the second electronic device 12 being measured below the predetermined threshold to prevent access to the network 13 and the at least one first electronic device 18. The predetermined number of at least one first electronic devices 18 is re-enabled in response to the detected RF signal 50 strength being above the predetermined threshold by either of the first and second access points 21, 23 and based upon the user privileges, as discussed in paragraphs [0030] and [0035].

Grounds of Rejection to be Reviewed on Appeal

Whether claim 1 is patentable under 35 U.S.C. §103(a) over Curtis et al. (United States Patent No. 5,963,599) in view of He et al. (United States Patent No. 6,088,451) and further in view of Hanson et al. (United States Patent No. 6,546,425).

Whether claims 10-12 and 14 are patentable under 35 U.S.C. 103(a) over Bahl (United States Patent No. 6,629,151) in view of He et al. and Porter et al. (United States Patent No. 6,745,013) and further in view of Hanson et al.

Argument

Rejection of claim 1 under 35 U.S.C. §103(a)

The law is adequately set forth in the Manual for Patent Examining Procedure (MPEP) for establishing a *prima facie* case under §103:

2141 35 U.S.C. 103; the Graham Factual Inquiries

...

BASIC CONSIDERATIONS WHICH APPLY TO OBVIOUSNESS REJECTIONS

When applying 35 U.S.C. 103, the following tenets of patent law must be adhered to:

- (A) the claimed invention must be considered as a whole;
- (B) the references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination;
- (C) the references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention; and
- (D) reasonable expectation of success is the standard with which obviousness is determined.

Hodosh v. Block Drug Co., Inc., 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986).

2142 Legal Concept of *Prima Facie* Obviousness [R-1]

... The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness. . . .

ESTABLISHING A *PRIMA FACIE* CASE OF OBVIOUSNESS

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not be based on applicants disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). See MPEP '2143 - '2143.03 for

decisions pertinent to each of these criteria.

The initial burden is on the examiner to provide some suggestion of the desirability of doing what the inventor has done. To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references. *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).

2143.03 All Claim Limitations Must Be Taught or Suggested [R-1]

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). All words in a claim must be considered in judging the patentability of that claim against the prior art. *In re Wilson*, 424 F.2d 1382, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837, F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

In addition to the above, existing precedent provides guidance for establishing a motivation to modify a reference or references. In particular, “[t]he motivation to modify the prior art must flow from some teaching in the art that suggests the desirability or incentive to make the modification needed to arrive at the claimed invention.” *Alza Corp. v. Mylan Laboratories Inc.*, 391 F.3d 1365 (Fed. Cir. 2004) (Exhibit A). While there is presently flux in the manner in which motivation to modify or combine references can be established, the United States Patent and Trademark Office has recently issued its position as evidenced by the Memorandum from Margaret A. Focarino, Deputy Commissioner for Patent Operations, on the Supreme Court decision on *KSR Int'l Co. v. Teleflex, Inc.*, 82 USPQ 2d 1385 (US 2007), dated May 3, 2007, which are attached as Exhibits B and C. In the Memorandum, it states that it remains necessary to identify the reason why a person of ordinary skill in the art

would have combined the prior art elements (or, in this instance, modify a reference) in the manner claimed.

Applicant respectfully submits that even if the references could be combined, the Office has failed to show that the combination discloses each and every limitation as claimed in the subject application. Further, the Office has failed to establish the requisite *prima facie* case of obviousness. Specifically, the Office has failed to provide a teaching or motivation to make the combination as suggested. The motivation to combine the cited references must flow from some teaching in the art that suggests the desirability or incentive to make the combination needed to arrive at the claimed invention. The mere fact that the cited references could be so combined would not have made the combination obvious unless the cited references suggested the desirability of the combination.

Claim 1 stands rejected under 35 U.S.C. §103(a) over Curtis et al. (United States Patent No. 5,963,599) in view of He et al. (United States Patent No. 6,088,451) and further in view of Hanson et al. (United States Patent No. 6,546,425).

Each and Every Feature Not Disclosed

Even if the combination of Curtis et al. with He et al. and Hanson et al. is deemed to be proper, which is addressed below, the *prima facie* case of obviousness has still not been established because the combination does not disclose, either expressly or inherently, each and every feature of the claimed invention as set forth in MPEP §2143.03. The Examiner's reliance on Curtis et al. with He et al. and Hanson et al. does not disclose, teach, or suggest the novel and unique limitations of the subject invention as claimed.

To reiterate, claim 1 recites that the first electronic device 18 is enabled in response to

the access point 20 detecting the RF signals 48, 50 *from both the first 18 and the second electronic devices 12 and based upon the user privileges.* Said another way, if the user privileges for the user exclude certain first electronic devices 18, then those first electronic device may remain disabled even if the signal strength is above the predetermined threshold. Once the first electronic device is enabled, the user 16 is allowed to access the first electronic device 18 and to access the network 13. Note that it is *the user that can access the first electronic device 18* once it has been enabled. The subject invention is not merely claiming two electronic devices communicate with one another as it seems is suggested by the Examiner's rejection. So long as the electronic devices communicate with the same access point, the first electronic device is enabled to allow access thereto. This is different than the references cited and relied upon by the Examiner and such a unique and novel limitation is not disclosed, taught, or suggested by the references.

Another unique and novel step that this not disclosed, taught, or suggested by the references is disabling the first electronic device 18 in response to either one of the signal strengths from the first electronic device 18 and the second electronic devices 12 no longer being detected by the access point 20 and re-enabling the first electronic device 18 in response to the access point 20 detecting the RF signals 48, 50 from both the first 18 and the second electronic devices 12 above the predetermined threshold and based upon the user privileges. As the user 16 moves about the working space, such as away from the first electronic device 18 and away from the access point 20, the signal strength from the second electronic device 12 drops below the predetermined threshold. In order to create a secure environment, the first electronic device 18 disables and prevents the user 16 from accessing the network 13 and the first electronic device 18, and thus prevents unauthorized access

thereto. As the user 16 re-enters the working space and moves close enough to the access point 20 such that the signal strength is above the predetermined threshold from the second electronic device 12, the first electronic devices 18 become re-enabled *to allow access to the user* 16 if authorized by the user privileges.

With reference to claim 1, the Examiner contends that Curtis et al. at Figure 5A and 5B and from column 7, line 63 to column 8, line 13, discloses “enabling the at least one first electronic device to allow the user having the second electronic device to access the network and the at least one first electronic device in response to at least one access point detecting the RF signals from both the at least one first and the second electronic devices”.

Applicant has reviewed Curtis et al. *as a whole* and such a disclosure is lacking. From Curtis et al., column 7, line 63 to column 8, line 13, it states:

“FIGS. 5a and 5b illustrates a block diagram of a simplified wireless local area network (WLAN) 10 such as may use a Truncated Maximum Likelihood Sequence Estimator (TMLSE) of the present invention. Wireless local area networks enable users of personal computers 14, which may include lap top computers, desk top computers and the like, to connect wirelessly to computer networks 18, 19. For example, a wireless radio 12 (not illustrated) may be embodied as a Personal Computer (PC) card and interfaced to the computer within a PC card slot of the computer (e.g. in conformity with the PCMCIA standard) to provide wireless connectivity to any other computer also equipped with the wireless radio. With the wireless radios making up the WLAN, communications can be ad-hoc between lap top and/or personal computers, as illustrated in FIG. 5b or communications may be between a computer and a computer or Ethernet network 19 through an access point 16 for wireless extensions.”

The passages relied upon by the Examiner merely disclose computers connecting wirelessly to a network. Curtis et al. does not disclose, teach, or suggest the subject invention as claimed. Specifically, there is no disclosure within Curtis et al. directed toward allowing access to the at least one first electronic device and the network to a user having a

second electronic device *in response to at least one access point detecting the RF signals from both the at least one first and the second electronic devices.* Curtis et al. does not disclose, teach, or suggest the second electronic device and the first electronic device communicating through the same access point to enable the first electronic device for the user to access the first electronic device and the network.

He et al., when viewed *as a whole*, discloses a security system and method to effectively protect network elements against unauthorized usage, disclosure, modification, and destruction of network resources and information. (*See column 2, lines 1-11*). However, the method by which He et al. achieves this security is in no way, shape, or form similar to that of the subject invention in that the security of He et al. is implemented between the network devices only and is not based upon communication with the same access point as claimed in the subject invention. In column 2, lines 12-35, He et al. discloses that the security system provides security mechanisms using a network security server coupled to a network and network elements that prevent access by user elements. User profiles, which are old and well known, are stored in a registration database and are associated with user passwords and credentials. Referring to column 25, lines 23-60 and Figure 4, the user's authority is established by registering the user in the user registration database, which is well known, to provide user access to the network elements. In Figure 6 and column 27, lines 13-22, He et al. discloses that the user must proceed through a log-in procedure by entering identification and a password.

In other words, He et al. does not disclose, teach, or suggest the step of allowing access to the at least one first electronic device and the network to a user having a second electronic device *in response to at least one access point detecting the RF signals from both*

the at least one first and the second electronic devices. Instead, He et al. relies upon old and well known techniques of requiring a user to enter the user identification and password. The remainder of He et al. merely discloses the security of the remaining elements of the network and does not address the claimed subject matter of allowing access to the user based upon the communication with the same access point of the first and second electronic device. In fact, He et al. does not disclose, teach, or suggest a second electronic device carried by a user to permit access the first electronic device.

Hanson et al., when viewed *as a whole*, merely discloses a system for establishing and maintaining connectivity between networked computing devices. More specifically, Hanson et al. discloses a system for providing continuous connection between intermittently connected devices such as handheld data units and personal computing devices. In other words, mobile users are able to access the same applications on the network as those stationary users. (*See column 2, lines 45-53*). Referring to column 38, lines 7-27, an example of the system disclosed in Hanson et al. is described as allowing a user to move about an area with a computer, i.e., second device, and the computer remains in communication with the network.

Nowhere in Hanson et al. is any disclosure whatsoever about the user authenticating to the network and the second electronic device being enabled in response to the first and second electronic devices communicating through the same access point. In other words, Hanson et al. does not disclose, teach, or suggest the step of allowing access to the at least one first electronic device and the network to a user having a second electronic device *in response to at least one access point detecting the RF signals from both the at least one first and the second electronic devices.*

The Examiner has not provided any reference, or motivation or suggestion to modify the combination of references, to arrive at the missing limitations identified above. Instead, the Examiner argues that these limitations are intended use and gives these limitations no patentable weight (*See Final Office Action, Dated October 5, 2006, page 2*). However, the subject claims are directed to a method and it is clear all limitations must be considered when viewing the claimed subject matter **as a whole**.

Applicant submits that in accordance with MPEP §2173.05(g), “a functional limitation is an attempt to define something by what it does, rather than by what it is (e.g., as evidenced by its specific structure or specific ingredients). There is nothing inherently wrong with defining some part of an invention in functional terms. Functional language does not, in and of itself, render a claim improper. *In re Swinehart*, 439 F.2d 210, 169 USPQ 226 (CCPA 1971). Further, a functional limitation must be evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used. A functional limitation is often used in association with an element, ingredient, or **step of a process to define a particular capability or purpose** that is served by the recited element, ingredient or **step**.”

The intended use identified by the Examiner can be analogized to a functional limitation associated with a step of the process, i.e., method, as highlighted above in MPEP §2173.05(g). The specific limitation discounted by the Examiner in claim 1 is shown below:

enabling the at least one of first electronic device (18) to allow the user (16) having the second electronic device (12) to access the network (13) and the at least one of first electronic device (18) in response to the at least one of access point (20) detecting the RF signals (48, 50) from both the at least one of first (18) and the second electronic devices (12) and based upon the user privileges

The functional language must be given consideration when considering the claim as a

whole. Applicant is not claiming to be the first to merely enable the first electronic device. The claim, when viewed as a whole, permits the user access to the network and the first electronic device by enabling the first electronic device for the user in response the same access point communicating with the first and second electronic devices. Such a limitation is not disclosed, taught, or suggested by any of the references, either alone or in combination. Moreover, the Examiner states on page 4 of the Final Office Action that the Examiner believes the *key word* is “disabling”. However, it is well known that the Examiner *must* consider the claim *as a whole* and cannot examine the claim limitation by limitation (or in this case word by word). The functional limitations included in the claims must be considered and evaluated for what they convey. Thus, the Examiner has improperly discounted the claim language and has not considered the claim as a whole.

Lack of Suggestion or Motivation

The subject invention is directed toward securing access to a network of multiple first electronic devices to the user having the second electronic device that is within a desired proximity, defined by both the electronic devices communicating with the same access point. In view of the failure of Curtis et al. to disclose the subject invention, it is improper, in determining whether a person of ordinary skill would have been led to this combination of references, simply to “[use] that which the inventor taught against its teacher.” *In re Lee*, 277 F.3d at 1343, citing *W.L. Gore v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983). See *In re Dow Chem. Co.*, 837 F.2d 469, 473, 5 U.S.P.Q.2d 1529, 1531-32 (Fed. Cir. 1988).

Additionally, it is respectfully submitted that impermissible hindsight is relied upon

by the Examiner in reaching the conclusion of obviousness. The use of hindsight is not permissible when making an obviousness determination. The CAFC stated,

Determination of obviousness can not be based on the hindsight combination of components selectively culled from the prior art to fit the parameters of the patented invention. There must be a teaching or suggestion within the prior art, or within the general knowledge of a person of ordinary skill in the field of the invention, to look to particular sources of information, to select particular elements, and to combine them in the way they were combined by the inventor. See Heidelberger Druckmaschinen AG v. Hantscho Commercial Prods., Inc. , 21 F.3d 1068, 1072, 30 USPQ2d 1377, 1379 (Fed.Cir. 1994) (“When the patented invention is made by combining known components to achieve a new system, the prior art must provide a suggestion or motivation to make such a combination.”); Northern Telecom, Inc. v. Datapoint Corp., 908 F.2d 931, 935, 15 USPQ2d 1321, 1324 (Fed.Cir. 1990) (the prior art must suggest to one of ordinary skill in the art the desirability of the claimed composition); Interconnect Planning Corp. v. Feil , 774 F.2d 1132, 1143, 227 USPQ 543, 551 (Fed.Cir. 1985).” ATD Corp. v. Lydall, Inc., 159 F.3d 534, 546, 48 USPQ2d 1321, 1329 (Fed. Cir. 1998). (attached as Exhibit D.)

The Examiner contends that hindsight is permissible so long it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made. However, the Examiner appears to be selectively culling the limitations from the cited references to fit the parameters of the claimed invention. The Examiner contends the Examiner identified adequate motivation, however, the Examiner merely provides a reason without providing any source of such a motivation. For example, on page 10 of the Final Office Action, the Examiner states, “[o]ne of ordinary skill would have been motivated to incorporate such teaching from He et al. because it would result in a more secure wireless networking environment.” The Examiner has merely stated a solution for a problem not provided for in either He et al. or Curtis et al. and suggests it would have been obvious to combine the teachings for the Examiner supplied reason. This is the exact problem addressed by impermissible hindsight and neither He et al. nor Curtis et al. are directed to

similar problems and the combination of the two would likely not provide a reasonable expectation of success.

Moreover, reliance on He et al. and Hanson et al. does not provide the omitted disclosure, teaching, or suggestion within Curtis et al. It is respectfully submitted that there is no suggestion or motivation disclosed within Curtis et al. to combine Curtis et al. with the teachings of He et al. and Hanson et al. Each of the relied upon references are directed toward different applications that have generally overlapping disclosures in that the references pertain to computers and networks. Neither addresses the same problem or is related in scope of technology as the claimed invention. While the teachings of He et al. may be used with the subject invention after the first electronic device is enabled, He et al. does not disclose, teach, or suggest enabling the first electronic device and the network to a user having a second electronic device *in response to at least one access point detecting the RF signals from both the at least one first and the second electronic devices*. He et al. merely relates to a security protocol that can be implemented on a network of computers. As such, reliance on He et al. does not overcome the failure to establish the requisite *prima facie* case of obviousness.

Similarly, Hanson et al. merely discloses wireless communication and does not disclose, teach, or suggest the method of securing access to a network from a user having a second electronic device.

Such a combination of Curtis et al. with He et al. and Hanson et al. employs impermissible hindsight and does not consider the claimed invention as a whole. In other words, the claimed invention is being analyzed element by element as a roadmap to find the prior art components and the Examiner is discounting the value of combining these elements

in a new way to achieve a new result. As is well known, the suggestion to combine references must not be derived by hindsight from knowledge of the claimed invention itself or in view of the Applicants disclosure.

Even if the art appears combinable or modifiable in a manner that will yield the claimed invention, this is insufficient to make the resultant modification obvious. The art must still suggest the desirability of the modification.

Therefore, it is respectfully submitted that the Examiner has failed to provide an adequate suggestion or motivation to combine Curtis et al. with He et al. and Hanson et al. to arrive at the subject invention as claimed. It is respectfully submitted that the 35 U.S.C. §103 rejection is improper and should be withdrawn. Thus, claim 1 is believed to be allowable. Claims 2 and 4-9, which depend directly or indirectly from claim 1, are also believed to be allowable.

Rejection of claim 10 under 35 U.S.C. §103(a)

The law for establishing a *prima facie* case of obviousness has been adequately set forth above.

Claims 10-12 and 14 stand rejected under 35 U.S.C. 103(a) over Bahl (United States Patent No. 6,629,151) in view of He et al. and Porter et al. (United States Patent No. 6,745,013) and further in view of Hanson et al. He et al. and Hanson et al. have been previously described above.

Lack of Suggestion or Motivation

Bahl discloses, when viewed *as a whole*, a method and system that interfaces

between wireless network hardware and software to provide specific wireless functionality. There is no disclosure, teaching, or suggestion to provide a system and method as claimed in the subject invention for providing security to a user carrying a second electronic device. Referring to column 2, lines 10-13, Bahl teaches away from the subject invention by stating that the hardware is forced to maintain a connection with a specific base station, whereas the subject invention specifically provides for allowing access based upon at least one access point out of the detecting two access points measuring a signal strength above the threshold and transmitting data through the access point. In other words, the selected access point is dynamic and not forced to maintain at a single access point.

With reference to claim 10, the Examiner contends that Bahl discloses enabling a predetermined number of first electronic devices in response to the RF signal from a second electronic device having a strength above predetermined threshold at either one of a first and second access points in Figure 3, column 5, lines 50-58, and column 8, lines 49-64.

Applicant has reviewed Bahl as a whole and such a disclosure is lacking. From Bahl, column 5, lines 50-58, it states:

“Turning to FIG. 3, an exemplary WLAN 118 is shown. The WLAN 118 is also connected to another network 134, and to a wire-based network 140. A computer, such as portable computer 120 and portable computer 130 can link to the WLAN through a Wireless Network Interface Card (WNIC) 122 or a WNIC 132. The WNIC 122 can communicate, in a wireless fashion with a base station 124, base station 126, or base station 128. In addition, WNIC 122 can communicate with another WNIC 132 directly.”

At column 8, lines 49-64, Bahl states:

“A wireless network connection allows a user the freedom to move around their environment. In order to do so, however, the WNIC 122 must be capable of supporting a handoff between two base stations, such as base stations 124 and 128 in FIG. 3. Thus, as the user moved from the vicinity of base station 124 to the vicinity of base station 128, the signal of base station

124 would become weaker and more prone to noise and error, and the signal of base station 128 would become stronger. When a certain threshold is reached, it becomes desirable for the WNIC 122 to communicate with base station 128 rather than base station 124. The ability of the WNIC 122 to end communication with base station 124 and start communicating with base station 128 without disconnecting the user from the network 118 is known as a handoff.”

It is unclear from the above passage, how such a limitation has been identified by the Examiner. Bahl does not disclose, teach, or suggest the subject invention as claimed. Specifically, there is no disclosure, teaching, or suggestion within Bahl directed toward enabling a predetermined number of first electronic devices in response to the signal strength being above a predetermined threshold at either the first or second access point and there is no disclosure, teaching, or suggestion or re-enabling the first electronic devices as claimed.

Bahl merely discloses wireless computers connecting wirelessly to a network as set forth in the passage relied upon by the Examiner. The subject invention is directed toward securing access to a network of multiple first electronic devices to the user having the second electronic device that is within a desired proximity, defined by either one of the access points measuring the signal strength above a predetermined threshold and maintaining the first electronic device enabled so long as at least one access point measures the signal strength above the predetermined threshold. In view of the failure of Bahl to disclose the subject invention, it is improper, in determining whether a person of ordinary skill would have been led to this combination of references, simply to “[use] that which the inventor taught against its teacher.” *In re Lee*, 277 F.3d at 1343, citing *W.L. Gore v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983). See *In re Dow Chem. Co.*, 837 F.2d 469, 473, 5 U.S.P.Q.2d 1529, 1531-32 (Fed. Cir. 1988).

Moreover, reliance on He et al., Porter et al. and Hanson et al. does not provide the

omitted disclosure, teaching, or suggestion within Bahl. He et al. and Hanson et al. are described fully above. Porter et al. discloses, when viewed *as a whole*, a system and method for controlling power levels of signals received at and from access points. Specifically, Porter et al. is focused on cellular networks, see column 4, line 28. Porter et al. does not disclose, teach, or suggest taking any additional steps, such as enabling or disabling other devices in communication with the network in response to detecting the signals from the access point. Porter et al. merely discloses and teaches measuring of power levels of signals from wireless devices and teaches adjusting the signal strength of the other devices to simulate that each device is the same distance away from the access point (*see column 9, lines 45-50 and column 10, lines 1-12*).

It is respectfully submitted that there is no suggestion or motivation disclosed within Bahl to combine Bahl with the teachings of He et al., Porter et al., and Hanson et al. As originally set forth in Applicant's prior response on page 15, each of the relied upon references are directed toward different applications that have generally overlapping disclosures in that the references pertain to computers and networks. Neither addresses the same problem or is related in scope of technology as the claimed invention, i.e. providing network access and security based upon the user carrying the second electronic device. Porter et al. is merely directed toward conserving power of a transmitter based upon detected signal strength. Porter et al. does not disclose, teach, or suggest enabling and disabling access to a network and first electronic devices in response to at least one access point detecting the signal strength above a predetermined threshold.

Again, the Examiner contends that adequate motivation has been supplied in the Examiner's own opinion, without out more, and concludes the combination is proper because

“it would increase security” (*see page 20 of the Final Office Action*). However, none of the references purports to address the security method as claimed in the subject invention. The Examiner is examining the claim, element by element, and finding prior art references which appear to disclose that element and applying it to the claim, which is impermissible.

The Examiner contends that Applicant “did not point out any errors with the motivation” at page 6 of the Final Office Action. Applicant respectfully submits that the Examiner has the initial burden of establishing a *prima facie* case of obviousness. Merely stating it would be obvious based upon the Examiner’s opinion does not satisfy the burden and it cannot shift the burden to the Applicant. However, as discussed above, Applicant set forth in the previous response that there was no teaching or suggestion to combine and modify the references as contended by the Examiner and that the Examiner was impermissibly searching the prior art element by element. Thus, the Examiner has not satisfied the burden of satisfying the *prima facie* case of obviousness as discussed above.

Such a combination of Bahl with He et al., Porter et al., and Hanson et al. employs impermissible hindsight and does not consider the claimed invention as a whole. In other words, the claimed invention is being analyzed element by element as a roadmap to find the prior art components and the Examiner is discounting the value of combining these elements in a new way to achieve a new result. As is well known, the suggestion to combine references must not be derived by hindsight from knowledge of the claimed invention itself or in view of the Applicants disclosure.

Even if the art appears combinable or modifiable in a manner that will yield the claimed invention, this is insufficient to make the resultant modification obvious. The art must still suggest the desirability of the modification.

Therefore, it is respectfully submitted that the Examiner has failed to provide an adequate suggestion or motivation to combine Bahl with He et al., Porter et al., and Hanson et al. to arrive at the subject invention as claimed.

Each and Every Feature Not Disclosed

Even if the combination of Bahl with He et al., Curtis et al. and Hanson et al. is deemed to be proper, the *prima facie* case of obviousness has still not been established because the combination does not disclose, either expressly or inherently, each and every feature of the claimed invention. As set forth above, the Examiner's reliance on Bahl does not disclose, teach, or suggest the novel and unique limitations of the subject invention as claimed.

Specifically, claim 10 recites that a predetermined number first electronic device 18 are enabled in response to detected RF signal strength being above the predetermined threshold at either one of the access points and based upon the user privileges. The subject invention is not merely having two electronic devices communicate with one another as it seems is suggested by the Examiner's rejection. So long as one access point is measuring the signal strength above the predetermined threshold, the predetermined number of first electronic devices remains enabled. This is different than the references cited and relied upon the Examiner and such a unique and novel limitation is not disclosed, taught, or suggested by the references.

Another unique and novel step that this not disclosed, taught, or suggested by the references is disabling the predetermined number of first electronic devices 18 in response to the signal strength from the second electronic devices 12 being measured below the

predetermined threshold. The predetermined number of first electronic devices 18 are re-enabled in response to either of the first and second access points detecting the RF signal above the predetermined threshold and based upon the user privileges.

Again, Applicant submits that in accordance with MPEP §2173.05(g), “a functional limitation is an attempt to define something by what it does, rather than by what it is (e.g., as evidenced by its specific structure or specific ingredients). There is nothing inherently wrong with defining some part of an invention in functional terms. Functional language does not, in and of itself, render a claim improper. *In re Swinehart*, 439 F.2d 210, 169 USPQ 226 (CCPA 1971). Further, a functional limitation must be evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used. A functional limitation is often used in association with an element, ingredient, or *step of a process to define a particular capability or purpose* that is served by the recited element, ingredient or *step*.”

The Examiner has impermissibly disregarded claim language and has not viewed the claim of the subject invention as a whole. In disregarding the “to” language in the claim, the Examiner has reduced the claim and attempted to find references element by element based upon the elements of the claims of the subject invention. As such, when viewing the claims of the subject invention as a whole, the combination of references suggested by the Examiner does not disclose, teach, or suggest each and every limitation. Moreover, even once combined, the combination requires modification to arrive at the claimed invention, which the Examiner provides based upon his own reasoning, which is impermissible as set forth in the Exhibit B, Focarino’s USPTO memorandum.

He et al., Portal et al. and Henson et al. do not provide the omitted claimed features

set forth above. Since, each and every feature claimed is not disclosed, taught, or suggested, it is respectfully submitted that the 35 U.S.C. §103 rejection is improper and should be withdrawn. Thus, claim 10 is believed to be allowable. Claims 11-12 and 14, which depend directly or indirectly from allowable claim 10, are also believed to be allowable.

CLOSING

For the reasons set forth above, the rejections of Claims 1-4 and 6-10 under 35 U.S.C. §103(a) must be reversed.

Respectfully submitted,

HOWARD & HOWARD ATTORNEYS, P.C.

July 3, 2007

Date

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CLAIMS APPENDIX

1. **(Previously Presented).** A method of securing access to a network (13), the network (13) including at least one first electronic device (18) and at least one access point (20), from a user (16) having a second electronic device (12), said method comprising the steps of:

transmitting a radio frequency (RF) signal (48) from the at least one of first electronic device (18);

detecting the RF signal (48) from the at least one of first electronic device (18) with the at least one of access point (20);

transmitting a radio frequency (RF) signal (50) from the second electronic device (12) including user information to identify the user (16);

detecting the RF signal (50) from the second electronic device (12) with the same at least one of access point (20);

retrieving user privileges for the user (16) from a user database based upon the user information;

enabling the at least one of first electronic device (18) to allow the user (16) having the second electronic device (12) to access the network (13) and the at least one of first electronic device (18) in response to the at least one of access point (20) detecting the RF signals (48, 50) from both the at least one of first (18) and the second electronic devices (12) and based upon the user privileges; and

disabling the at least one of first electronic device (18) in response to either of the RF signals (48, 50) from the at least one of first and second electronic devices (18, 12) no longer being detected by the at least one of access point (20) to prevent access to the network

(13) and the first electronic device (18); and

re-enabling the at least one of first electronic device (18) in response to the at least one of access point (20) detecting the RF signals (48, 50) from the at least one of first (18) and the second electronic devices (12) based upon the user privileges.

2. **(Previously Presented).** A method as set forth in claim 1 further including the steps of measuring a signal strength for the RF signal (48, 50) from both the at least one of first (18) and the second electronic devices (12), comparing the signal (48, 50) strengths to a predetermined threshold, and enabling the at least one of first electronic device (18) in response to both of the signal strengths being above the predetermined threshold.

3. **(Cancelled).**

4. **(Previously Presented).** A method as set forth in claim 2 further including the step of transmitting data from either one of the at least one of first (18) and the second electronic devices (12) to the at least one of access point (20) and routing data from the at least one of access point (20) to the other electronic device.

5. **(Previously Presented).** A method as set forth in claim 2 further including the step of activating either one of the at least one of first (18) and the second electronic device (12) to transmit the data directly to the other in response to instructions from the at least one of access point (20) thereby bypassing the at least one of access point (20).

6. **(Previously Presented).** A method as set forth in claim 5 wherein the step of activating either one is further defined as transmitting timing intervals from the at least one of access point (20) to either one of the at least one of first (18) and the second electronic devices (12) and activating the one during the timing intervals to detect the other.

7. **(Previously Presented).** A method as set forth in claim 15 further including the steps of detecting the RF signals **(48, 50)** from the at least one of first **(18)** and the second electronic devices **(12)** by a different at least one of access point **(20)**, measuring the RF signal **(48, 50)** strengths at the different at least one of access point **(20)**, and re-enabling the at least one of first electronic device **(18)** in response to the RF signals **(48, 50)** from the at least one of first **(18)** and the second electronic device **(12)** being above the predetermined threshold.

8. **(Previously Presented).** A method as set forth in claim 7 further including the step of loading user data into each of the at least one of access points **(20)** in response to at least one access point **(20)** measuring the RF signal **(50)** from the second electronic device **(12)** as being above the predetermined threshold.

9. **(Previously Presented).** A method as set forth in claim 8 further including the step of synchronizing the user data from the different at least one of access points **(20)** to the at least one of first electronic device **(18)** in response the RF signal **(50)** from the second electronic device **(12)** being above the predetermined threshold at the different at least one of access point **(20)**.

10. **(Previously Presented).** A method of securing access to a network (13), the network (13) including at least one first electronic device (18) and at least one access point (20), from a user (16) having a second electronic device (12), said method comprising the steps of:

transmitting a radio frequency (RF) signal (50) from the second electronic device (12) including user information to identify the user (16) to establish communication with at least one access point (20);

detecting the RF signal (50) from the second electronic device (12) with a first (21) and a second access points (23);

measuring the strength of the RF signal (50) from the second electronic device (12) at the first and second access points (21, 23);

comparing a maximum measured RF signal (50) strength by either of the first and second access points (21, 23) to a predetermined threshold;

retrieving user privileges for the user (16) from a user database based upon the user information;

enabling a predetermined number of at least one first electronic devices (18) in response to the detected RF signal (50) strength being above the predetermined threshold and based upon the user privileges to allow access to the network (13) and the at least one of first electronic device (18);

transmitting data from the second electronic device (12) through the at least one of access point (20) which measures the maximum RF signal (50) strength to the predetermined number of at least one first electronic devices (18) thereby establishing

communication between the at least one of first electronic devices (18) and the second electronic device (12);

disabling the at least one of first electronic devices (18) in response to the RF signal (50) strength from the second electronic device (12) being measured below the predetermined threshold to prevent access to the network (13) and the at least one of first electronic device (18); and

re-enabling the predetermined number of at least one first electronic devices (18) in response to the detected RF signal (50) strength being above the predetermined threshold by either of the first and second access points (21, 23) and based upon the user privileges.

11. **(Original).** A method as set forth in claim 10 further including the step of loading user data into the first and the second access points (21, 23) in response to the RF signal (50) from the second electronic device (12) being above the predetermined threshold at either of the first and the second access points (21, 23).

12. **(Original).** A method as set forth in claim 11 further including the step of transferring communication to one of the first and second access points (21, 23) in response to the RF signal (50) strength at the other access point falling below the predetermined threshold.

13. **(Cancelled).**

14. **(Previously Presented).** A method as set forth in claim 12 further including the step of removing the user data from the first and the second access points

(21, 23) in response to the RF signal (50) strength falling below the predetermined threshold at the first and second access points (21, 23).

15. **(Previously Presented).** A method as set forth in claim 2 wherein the step of disabling the at least one of first electronic device (18) is further defined as disabling the at least one of first electronic device (18) in response to either one of the signal (48, 50) strengths from the at least one of first electronic device (18) and the second electronic devices (12) being measured below the predetermined threshold by the at least one of access point (20) to prevent access to the network (13) and the first electronic device (18).

EVIDENCE APPENDIX

Exhibit A: *Alza Corp. v. Mylan Laboratories Inc.*, 80 USPQ2d 1001 (Fed. Cir. 2006)

Exhibit B: Memorandum from Margaret A. Focarino, Deputy Commissioner for Patent Operations, on the Supreme Court decision on *KSR Int'l Co. v. Teleflex, Inc.*

Exhibit C: *KSR Int'l Co. v. Teleflex, Inc.*, 82 USPQ 2d 1385 (US 2007),

Exhibit D: *ATD Corp. v. Lydall, Inc.*, 159 F.3d 534 (Fed. Cir. 1998)

EXHIBIT A

Source: USPQ, 2d Series (1986 - Present) > U.S. Court of Appeals, Federal Circuit > Alza Corp. v. Mylan Laboratories Inc., 80 USPQ2d 1001 (Fed. Cir. 2006)

Alza Corp. v. Mylan Laboratories Inc., 80 USPQ2d 1001 (Fed. Cir. 2006)

80 USPQ2d 1001

Alza Corp. v. Mylan Laboratories Inc.
U.S. Court of Appeals
Federal Circuit
No. 06-1019

Decided September 6, 2006

Headnotes

PATENTS

[1] Patentability/Validity — Obviousness — Person of ordinary skill in art (►115.0902)

Patentability/Validity — Obviousness — Combining references (►115.0905)

Under non-rigid "motivation-suggestion-teaching" test, suggestion to combine prior art references can be found in knowledge generally available to person of ordinary skill in art, as well as in references themselves, and expert testimony therefore is pertinent to evaluation of *prima facie* case of obviousness if such testimony is relevant to determining knowledge that person of ordinary skill in art would have possessed at given time; in present case, infringement defendants have established, by clear and convincing evidence, that invention of patent for extended-release oxybutynin formulation was rendered obvious by combination of prior art references, since record shows that teachings of references would have conveyed to person of ordinary skill, once motivated to use oxybutynin, reasonable expectation of success in manufacturing controlled release oxybutynin formulation, since testimony of defendant's expert supports finding that, based on oxybutynin's lipophilicity, person of skill in art would have had reasonable expectation that oxybutynin would be colonically absorbed and therefore would have been motivated to produce claimed extended release formulation, and since references cited by plaintiff are entirely consistent with that finding.

[2] Infringement — Literal infringement (►120.05)

Plaintiff failed to establish that accused extended-release oxybutynin formulation infringed patent in suit, since patent specifically requires that time-course of *in vivo* oxybutynin release for claimed formulation fall within certain boundaries, since plaintiff presented evidence of blood plasma concentration-versus-time profiles for both accused formulation and embodiment of formulation claimed in patent, but, even if it is assumed that drug is rapidly taken up into bloodstream upon dissolution, there is no expert testimony or other evidence to show that plasma concentration-versus-time data establishes *in vivo* release rates for either accused formulation or patented embodiment, and since plaintiff's evidence of *in vitro* dissolution rates is irrelevant absent evidence demonstrating that *in vitro* system is good model of actual *in vivo* behavior; conclusion of noninfringement does not require specific finding that two bodies of evidence presented by plaintiff are inadequate when considered both individually and in

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combination, since instant case does not present situation in which two pieces of otherwise severely inadequate evidence create great probative value synergistically.

Particular Patents

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Particular patents — Chemical — Oxybutynin formulations

6,124,355, Guittard, Jao, Marks, Kidney, and Gumucio, oxybutynin therapy, judgment of invalidity and noninfringement affirmed.

Case History and Disposition

Appeal from the U.S. District Court for the Northern District of West Virginia, Keeley, C.J.

Action by Alza Corp. against Mylan Laboratories Inc. and Mylan Pharmaceuticals Inc. for patent infringement. Plaintiff appeals from judgment of invalidity and noninfringement following bench trial. Affirmed.

Attorneys

Gregory L. Diskant, Jeffrey I.D. Lewis, and Richard J. McCormick, of Patterson, Belknap, Webb & Tyler, New York, N.Y., for plaintiff-appellant.

John B. Wyss, James H. Wallace Jr., Kevin P. Anderson, and Robert J. Scheffel, of Wiley, Rein & Fielding, Washington, D.C., for defendants-appellees.

Judge

Before Gajarsa, circuit judge, Clevenger, senior circuit judge, and Prost, circuit judge.

Opinion Text

Opinion By:

Gajarsa, J.

Alza Corp. ("Alza") appeals from the district court's judgment, after a bench trial, of noninfringement and invalidity of claims 1-3, 11, 13 and 14 of U.S. Patent No. 6,124,355¹ ("the '355 patent") in favor of Mylan Laboratories, Inc. and Mylan Pharmaceuticals, Inc. (collectively, "Mylan"). *Alza Corp. v. Mylan Labs., Inc.*, 388 F.Supp.2d 717 (N.D.W. Va. 2005) ("Alza II"). The infringement arose from Mylan's filing of two Abbreviated New Drug Applications ("ANDAs") for a generic version of the once-a-day extended release formulation of the anti-incontinence drug oxybutynin, *id.* at 720, which Alza has been marketing as Ditropan XL®. *Id.* at 738. This court has jurisdiction pursuant to 28 U.S.C. § 1295(a)(1). For the reasons stated below, we affirm the district court's judgment of noninfringement and invalidity.

¹ The '355 patent issued to Guittard et al. and was assigned to Alza.

I. BACKGROUND

This litigation arose from Mylan's and Impax's filings of ANDAs for once-daily, controlled-release oxybutynin formulations. Oxybutynin is a drug used to treat urinary incontinence. Once-a-day dosing provides the usual benefits of convenience, steady-dosing, and in addition, possibly reduced absorption of a metabolite that leads to side-effects. Claim 2 of the '355 patent is representative.

2. A sustained-release oxybutynin formulation for oral administration to a patient in need of treatment

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for urge incontinence comprising a therapeutic dose of an oxybutynin selected from the group consisting of oxybutynin and its pharmaceutically acceptable salt that *delivers* from 0 to 1 mg in 0 to 4 hours, from 1 mg to 2.5 mg in 0 to 8 hours, from 2.75 to 4.25 mg in 0 to 14 hours, and 3.75 mg to 5 mg in 0 to 24 hours for treating urge incontinence in the patient.

col. 17, ll. 31-38 (emphasis added).

The district court construed the '355 patent claims in its *Markman Order*, reported at *Alza Corp. v. Mylan Labs., Inc.*, 349 F.Supp.2d 1002 (N.D.W. Va. 2004) ("Alza I"). The court construed the word "deliver" to refer to the rate of *in vivo* release in the gastrointestinal ("GI") tract. See *id.* at 1019.

Alza did not present direct evidence that Mylan's ANDA formulation released drug in the GI tract at the rates claimed by the '355 patent. However, it did offer two other types of evidence: 1) the rate at which the generic product released oxybutynin in an *in vitro* dissolution apparatus, and 2) the rate at which the ANDA product resulted in the accumulation of oxybutynin in the bloodstream.

The district court found that Alza had failed to meet its burden of proof on infringement. The district court also found the asserted claims of the '355 patent to be invalid as both anticipated and obvious in light of the prior art. For the reasons stated below, we affirm the invalidity holding on obviousness grounds, and consequently, we do not need to reach Alza's arguments regarding anticipation. We also affirm the holding of noninfringement.

II. DISCUSSION

A. Standard of review

Infringement is a question of fact that, after a bench trial, we review for clear error. See,

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e.g., *Ferguson Beauregard/Logic Controls, Div. of Dover Res., Inc. v. Mega Sys., LLC*, 350 F.3d 1327, 1338 [69 USPQ2d 1001] (Fed. Cir. 2003). Under the clear error standard, a reversal is permitted only when this court is left with a definite and firm conviction that the district court was in error. *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1164 [77 USPQ2d 1865] (Fed. Cir. 2006).

As for obviousness, a claimed invention is unpatentable if the differences between it and the prior art are "such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art." 35 U.S.C. § 103(a) (2000); *In re Kahn*, 441 F.3d 977, 985 [78 USPQ2d 1329] (Fed. Cir. 2006) (citing *Graham v. John Deere Co.*, 383 U.S. 1, 13-14, [148 USPQ 459] (1966)). Obviousness is a question of law, reviewed *de novo*, based upon underlying factual questions which are reviewed for clear error following a bench trial. *Ruiz v. A.B. Chance Co.*, 357 F.3d 1270, 1275 [69 USPQ2d 1686] (Fed. Cir. 2004). These "underlying factual inquiries includ[e]: (1) the scope and content of the prior art; (2) the level of ordinary skill in the prior art; (3) the differences between the claimed invention and the prior art; and (4) objective evidence of nonobviousness." *In re Dembicza*, 175 F.3d 994, 998 [50 USPQ2d 1614] (Fed. Cir. 1999). Similarly, "[t]he presence or absence of a motivation to combine references in an obviousness determination is a pure question of fact," *In re Gartside*, 203 F.3d 1305, 1316 [53 USPQ2d 1679] (Fed. Cir. 2000); *accord Winner Int'l Royalty Corp. v. Wang*, 202 F.3d 1340, 1348 [53 USPQ2d 1580] (Fed. Cir. 2000), as is the presence or absence of a "reasonable expectation of success" from making such a combination, *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 [77 USPQ2d 1865] (Fed. Cir. 2006). Because "a patent retains its statutory presumption of validity, see 35 U.S.C. § 282, ... the movant retains the burden to show the invalidity of the claims by clear and convincing evidence as to underlying facts." *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1349 [60 USPQ2d 1001] Fed. Cir. 2001] (internal quotations omitted).

In *Graham*, the Court held that the obviousness analysis begins with several basic factual inquiries: "[1] the scope and content of the prior art are to be determined; [(2)] differences between the prior art

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and the claims at issue are to be ascertained; and [(3)] the level of ordinary skill in the pertinent art resolved." 383 U.S. at 17. After ascertaining these facts, the Court held that the obviousness *vel non* of the invention is then determined "against th[e] background" of the *Graham* factors. *Id.* at 17-18 (emphasis added). Clearly, the Court recognized the importance of guarding against hindsight, as is evident in its discussion of the role of secondary considerations as "serv[ing]to guard against slipping into use of hindsight and to resist the temptation to read into the prior art the teachings of the invention in issue." *Id.* at 36.

The Court of Appeals for the Federal Circuit's and its predecessor's "motivation to combine" requirement likewise prevents statutorily proscribed hindsight reasoning when determining the obviousness of an invention. *Kahn*, 441 F.3d at 986 ("[T]he 'motivation-suggesting-teaching' requirement protects against the entry of hindsight into the obviousness analysis."); *In re Fridolph*, 30 CCPA 939, 942 (1943) ("[I]n considering more than one reference, the question always is: does such art suggest doing the thing the [inventor] did."). According to the "motivation-suggesting-teaching" test, a court must ask "whether a person of ordinary skill in the art, possessed with the understandings and knowledge reflected in the prior art, and motivated by the general problem facing the inventor, would have been led to make the combination recited in the claims." *Kahn*, 441 F.3d at 988 (citing *Cross Med. Prods., Inc., v. Medtronic Sofamor Danek, Inc.*, 424 F.3d 1293, 1321-24 [76 USPQ2d 1662] (Fed. Cir. 2005)).

This requirement has been developed consistent with the Supreme Court's obviousness jurisprudence as expressed in *Graham* and the text of the obviousness statute that directs us to conduct the obviousness inquiry "at the time the invention was made" 35 U.S.C. § 103. As we explained in *Kahn*,

The motivation-suggestion-teaching test picks up where the analogous art test leaves off and informs the *Graham* analysis. To reach a non-hindsight driven conclusion as to whether a person having ordinary skill in the art at the time of the invention would have viewed the subject matter as a whole to have been obvious in view of multiple references, the Board must provide some rationale, articulation, or reasoned basis to

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explain why the conclusion of obviousness is correct. The requirement of such an explanation is consistent with governing obviousness law

441 F.3d at 987. We further explained that the "motivation to combine" requirement "[e]ntails consideration of both the 'scope and content of the prior art' and 'level of ordinary skill in the pertinent art' aspects of the *Graham* test." *Id.* at 986.

At its core, our anti-hindsight jurisprudence is a test that rests on the unremarkable premise that legal determinations of obviousness, as with such determinations generally, should be based on evidence rather than on mere speculation or conjecture. Our court's analysis in *Kahn* bears repeating:

A suggestion, teaching, or motivation to combine the relevant prior art teachings *does not have to be found explicitly in the prior art*, as "the teaching, motivation, or suggestion may be implicit from the prior art as a whole, rather than expressly stated in the references... . The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." However, rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be *some* articulated reasoning with *some* rational underpinning to support the legal conclusion of obviousness. This requirement is as much rooted in the Administrative Procedure Act [for our review of Board determinations], which ensures due process and non-arbitrary decisionmaking, as it is in § 103.

441 F.3d at 987-88 (quoting *In re Kotzab*, 217 F.3d 1365, 1370 [55 USPQ2d 1313] (Fed. Cir. 2000)) (citations omitted) (emphases added)). There is flexibility in our obviousness jurisprudence because a motivation may be found *implicitly* in the prior art. We do not have a rigid test that requires an actual teaching to combine before concluding that one of ordinary skill in the art would know to combine

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references. This approach, moreover, does not exist merely in theory but in practice, as well. Our recent decisions in *Kahn* and in *Cross Medical Products* amply illustrate the current state of this court's views. See *Kahn*, 441 F.3d at 988 (affirming the PTO's obviousness finding, explaining that a motivation to combine may be found in implicit factors, such as the "knowledge of one of ordinary skill in the art, and [what] the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art"); *Cross Med. Prods.*, 424 F.3d at 1322 (reversing a district court ruling of nonobviousness and explaining that "the motivation to combine need not be found in prior art references, but equally can be found in the knowledge generally available to one of ordinary skill in the art" such as knowledge of a problem to be solved).

In conclusion, our approach has permitted us to continue to address an issue of law not readily amenable to bright-line rules, as we recall and are guided by the wisdom of the Supreme Court in striving for a "practical test of patentability." *Graham*, 383 U.S. at 17.

B. Description of the technology

The patent at issue is directed generally to an extended release form of oxybutynin. Because the subject matter of the patent falls roughly under the rubric of pharmacology, we give a brief orientation to the field, based upon the record. In general, when a drug is swallowed, it is (1) dissolved in the gastrointestinal ("GI") tract; (2) absorbed from the GI tract into the bloodstream; (3) distributed from the blood into body tissues; and (4) metabolized and eliminated from the bloodstream. The GI tract includes the stomach, small intestine and the colon, and orally administered drugs pass through these portions of the GI tract in turn. Drugs may be administered in different dosage forms,² which may include not only the drug itself but also ingredients intended to modulate the rate of release of the drug from the dosage form.

² Here we are discussing oral dosage forms, specifically.

Dosage forms may be described as immediate-release, e.g., such as where the drug is quickly released in the stomach, or as sustained/extended-release, where the drug is slowly released as the formulation traverses the GI tract. The rate of absorption of a drug from the GI tract into the bloodstream may change as it passes through the GI tract. The rate of absorption for a dissolved drug in a given portion of the GI tract also varies from drug to drug.

After roughly 8-12 hours a typical dosage form will reach the colon. If, hypothetically, a

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particular drug is simply not absorbed from the colon into the bloodstream, then it may make little sense to develop an extended-release dosage form that is capable of "withholding" the release of some fraction of that drug until it reaches the colon. In other words, under these hypothetical conditions, there may be little motivation to design an oral dosage form capable of releasing drug more slowly than over an approximately 8-12 hour time course, because such drug would be released in the colon, where it is (hypothetically) not absorbed.

The '355 patent claims an extended release oxybutynin formulation. Alza argues that one of ordinary skill in the art would not have believed that oxybutynin could be absorbed in the colon. Absent such absorption, Alza contends that one of ordinary skill in the art lacked the motivation to make the claimed extended release formulation, and that the district court therefore erred in holding that the asserted claims are invalid as obvious over the prior art. For the reasons set forth below, Alza's arguments fail.

C. Invalidity

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The district court based its invalidity holding both on anticipation and obviousness grounds. Because we affirm its holding based on obviousness, we do not need to address the parties' anticipation arguments.

In finding the asserted claims of the '355 patent to be obvious, the district court considered, *inter alia*, the following prior art: U.S Patent Nos. 5,399,359 ("the Baichwal patent"); 5,082,688 ("the Wong patent"); and 5,330,766 ("the Morella patent").

The Morella patent discloses a "sustained-release pharmaceutical composition including an active ingredient of high solubility in water" According to the specification, highly soluble drugs had posed special challenges for the development of sustained release forms, which the inventors had set out to solve. "Sustained-release" is defined as release of the active ingredient at a rate that maintains therapeutic, nontoxic blood levels "over an extended period of time e.g. 10 to 24 hours or greater." Highly water soluble drugs were considered to be those having an aqueous solubility of at least roughly 1 part in 30. The commercially available hydrochloride salt of oxybutynin is freely soluble at neutral pH. The patent uses morphine as an example of an active ingredient that can be used in its compositions. Figure 5 demonstrates that one such composition is capable of dispensing morphine at what appears to be an approximately steady rate over the course of 24 hours. Claim 2 of the patent claims "genitourinary smooth muscle relaxants" as one of several types of active ingredients to use in the dosage form identified in claim 1. The specification also identifies oxybutynin as a highly water soluble genitourinary smooth muscle relaxant. Morella also teaches that "the dissolution rate of the soluble drug at various pH's can be modified at will."

The Baichwal patent teaches a 24 hour extended release oxybutynin formulation. These formulations use an enteric-coated polymer matrix similar to Mylan's accused product. It also teaches methods of modifying the dosage forms to slow the release rates. During prosecution of the '355 patent, the inventor overcame an anticipation rejection by arguing that his invention had a release rate slower than those of the dissolution data presented in Baichwal.³ The examiner agreed and withdrew his rejection.

³ Tables 15 and 18 of Baichwal, for example, disclose *in vitro* dissolution rates in which roughly half of the drug is dissolved by four hours.

The Wong patent teaches a bilayer osmotic pump dosage form ("the OROS system") used in the preferred embodiment of the '355 patent. Wong teaches that this system can be used to deliver any drug over a 24 hour period, and Figure 11 of the patent discloses release rates falling within the claimed release rates of the '355 patent. The Wong patent does not specifically teach using oxybutynin with the claimed release technology, but it does teach using several categories of drugs of which oxybutynin is a member, such as anti-cholinergics, analgesics, muscle relaxants and urinary tract drugs.

In analyzing the obviousness issue, the district court first identified the level of ordinary skill in the art, finding the person of ordinary skill to have either an advanced degree in pharmacy, biology, chemistry or chemical engineering and at least two years of experience with controlled-release technology; or a bachelor's degree in one (or more) of those fields plus five years of experience with such technology. Second, the court examined whether there was a motivation "in the prior art or elsewhere that would have led one of the ordinary

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skill in the art to combine references," *Alza II*, 388 F.Supp.2d at 737 (citing *Ruiz*, 234 F.3d at 664 (internal quotations omitted)), and with a "reasonable expectation of success," *id.* (citing *In re O'Farrell*, 853 F.2d 894, 904 [7 USPQ2d 1673] (Fed. Cir. 1988)). Third, the district court examined secondary considerations of nonobviousness. After making these factual determinations, it concluded that Mylan had established a strong *prima facie* case of obviousness, which Alza had failed to rebut through secondary considerations.

The court concluded that Mylan had demonstrated Alza's patent to be invalid for obviousness by clear and convincing evidence.⁴ We agree.

⁴ Having reviewed Alza's sundry contentions that the district court made findings inconsistent with the appropriate burdens of proof for infringement and invalidity, we find them to be without merit.

[1] While we have carefully considered all of the parties' arguments, we discuss principally the dispute over satisfaction of one predicate to a finding of obviousness: that a person of ordinary skill in the art would have had a "motivation to combine" the prior art to achieve the claimed invention and that she would have had a "reasonable expectation of success" in doing so. As an initial matter, we agree with the district court that "on a purely mechanical level, a person of ordinary skill in the art would have a reasonable expectation of success of manufacturing a 24 hour controlled-release oxybutynin formulation ... *once motivated to use oxybutynin.*" *Id.* at 739. For example, Wong teaches a rate adjustable extended release dosing technology and release rates falling within the claimed parameters. Baichwal and Wong likewise teach ways of achieving slow rates of release, with Baichwal actually teaching extended-release oxybutynin, although arguably not as slowly as is claimed in the '355 patent.⁵

⁵ The patent examiner initially rejected the '355 patent as anticipated by Baichwal, but subsequently allowed its issuance.

Indeed, Alza's principal argument is that no one of ordinary skill in the art would have been motivated to adapt the Morella, Baichwal and Wong technology to oxybutynin *in the first place*, because a person of ordinary skill in the art would have had no reason to expect that such an extended release oxybutynin formulation would have therapeutic value. The issues, as explained above, reduce essentially to whether one of ordinary skill in the art in 1995 would have had a reasonable expectation that oxybutynin would be colonically absorbed and therefore would have been motivated to produce the claimed extended release formulation.

The district court concluded that "the weight of the evidence clearly and convincingly establishes that a person of ordinary skill in the art in 1995 would reasonably expect oxybutynin to absorb in the colon ... [and] have a reasonable expectation of success of producing a 24 hour oxybutynin formulation meeting the claims of the '355 patent."⁶ *Alza II*, 388 F.Supp.2d at 740. Alza argues, however, that the district court erred because "[t]here was no prior art evidence supporting this finding." According to Alza, "[t]here was no contemporaneous documentation supporting the view that any one factor—lipophilicity or anything else—existed to identify successful candidates for once-a-day delivery." It also argues that two prior art references "decisively undercut" the opinion of Mylan's expert, Dr. Amidon, which the district court cited in support of its conclusion. See *Alza II*, 388 F.Supp.2d at 739-740.

⁶ The '355 patent issued on September 26, 2000 and claimed priority as far back as 1995. See '355 patent, col. 1, ll. 5-12. The district court treated 1995 as the relevant date for the obviousness inquiry, see *Alza II*, 388 F.Supp.2d at 740, as do both parties in their obviousness arguments before this court. See, e.g., Alza Reply Br. at 13 (stating that "[t]he dispositive obviousness issue was whether colonic absorption of oxybutynin was reasonably expected in 1995") (emphasis added); Mylan Br. at 6 & n.2 (referring to evidence establishing "the clear expectation of one skilled in the art in 1995" and noting in a footnote that 1995 is "[t]he earliest possible date to which Alza asserts priority.") (emphasis added).

As an initial matter, it is essential to recognize that, as we have explained above, under our non-rigid "motivation-suggesting-teaching" test, a suggestion to combine need not be found in the prior art. See *Cross Med. Prods.*, 424 F.3d at 1322 ("[T]he motivation to combine need not be found in prior art references, but equally can be found in the knowledge generally available to one of ordinary skill in the art . . ."). Accordingly, where the testimony of an expert witness is relevant to determining the knowledge that a person of ordinary skill in the art would have possessed at a given time, this is one kind of evidence that is pertinent to our evaluation of a *prima facie* case of obviousness. We now

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turn to consider whether the relevant evidence, including the expert testimony and the prior art, when viewed as a whole supports the findings of the district court. We conclude that the findings of the district court were not clearly erroneous.

Mylan's expert, Dr. Amidon, testified that based on its lipophilicity, he would "expect oxybutynin to be a highly permeable" compound that is "rapidly absorbed" along the length of the GI tract, including the colon. Later, when challenged about the predictive value of lipophilicity, Dr. Amidon explained, "I would say there were some unknowns, but again lipophilic drugs would be well absorbed. That would be—that was the general understanding at the time."

Although Alza argues that two prior art references "decisively undercut Dr. Amidon's hindsight opinion," these references are in fact not inconsistent with the general principle that the extent of a drug's colonic absorption correlates with its lipophilicity. Indeed, the first reference, a 1990 publication in the *Journal of Pharmaceutical Sciences*, states that "[i]n general, the more lipophilic drugs were transported rapidly." P. Artursson, *Epithelial Transport of Drugs in Cell Culture. I: A Model for Studying the Passive Diffusion of Drugs over Intestinal Absorptive (Caco-2) Cells*. 79 J. Pharm. Sci. 476, 481 (1990). Alza, however, cites this reference narrowly for its observation that a highly lipophilic analog of a particular drug did not follow the general rule that lipophilic drugs were transported more quickly. *Id.* Granted, the authors admit that "[t]he reason for this [deviation]is currently unknown," and they postulate that it may be related to a physicochemical factor other than lipophilicity, namely steric hindrance.⁷ *Id.* But the mere fact that the colonic absorption rate of a drug may be predicted most precisely by using "many factors," rather than "lipophilicity" alone, does not negate the general predictive utility of lipophilicity in estimating the extent of colonic absorption.

⁷ Dr. Chancellor, Alza's expert, likewise characterized colonic absorption as having been understood as being dependent on several physicochemical and physiological variables, of which lipophilicity was one.

The second prior art reference cited by Alza, *Absorption of Polar Drugs Following Caecal Instillation in Healthy Volunteers*, is similarly unavailing to it. Riley, et al., 6 Aliment. Pharmacol. Ther. 701, 705 (1992). Again, this reference teaches that while the correlation is not perfect, lipophilicity tended to suggest colonic absorption, stating that "[t]he relationship between the physical characteristics of a drug and its colonic absorption is not yet clear but studies in the rat suggest that *lipophilic drugs are well absorbed along the length of the gastrointestinal tract*, whereas hydrophobic polar drugs are absorbed much less from the colon than from the small intestine." *Id.* (emphasis added).

Far from teaching away or detracting from the weight of Dr. Amidon's testimony, these prior art references, taken as a whole, are entirely consistent with the finding that in 1995 a person of ordinary skill in the art would have expected a general, albeit imperfect, correlation between a drug's lipophilicity and its colonic absorptivity. Accordingly, we cannot perceive clear error in the district court's factual findings that while colonic absorption was not *guaranteed*, the evidence, viewed as a whole, is clear and convincing

that a person of ordinary skill in the art would nonetheless have perceived a reasonable likelihood of success and that she would have been motivated to combine prior art references to make the claimed invention.

Likewise, we find no error in the district court's consideration of secondary indicia of obviousness. We therefore affirm its legal conclusion of obviousness, finding the district court to have correctly held that Mylan met its burden of overcoming the presumption of validity that attaches to an issued patent.

D. Infringement

The '355 patent specifically describes the rate of oxybutynin release from its "extended release" formulations, requiring that the time-course of *in vivo* oxybutynin release falls within certain boundaries. That is, at certain times, the cumulative amount of dissolved (released) drug must fall within certain ranges. To prove infringement, Alza bore the burden of proving, *inter alia*, that Mylan's accused generic formulation exhibited an *in vivo* release profile falling within the claimed ranges at the relevant times.

At trial, Alza presented no direct evidence of how quickly the accused product dissolved *in vivo*. *Alza II*, at 722. However, it did offer two kinds of indirect evidence as measures of the rate of *in vivo* release. *Id.* First, it presented

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evidence of the blood plasma concentration versus time profiles for both the accused ANDA formulation and Ditropan, an embodiment of the '355 patent. Second, it presented evidence of the rate of release not in the GI tract but in pieces of laboratory apparatus under certain experimental conditions, so-called *in vitro dissolution*. The critical deficiency in the evidence presented by Alza was not that it was "indirect" rather than "direct," but rather that it failed to credibly link these pieces of evidence with the relevant pharmacokinetic parameter—the rate of *in vivo* dissolution in the GI tract.

Thus, the district court explained that Alza had failed to demonstrate how evidence of the rate of dissolution of drug in the GI tract could be extracted from plots of plasma concentration versus time. The district court accepted Alza's simplifying assumption about oxybutynin rapidly being absorbed following dissolution such that the rates of *in vivo* dissolution parallel the rate of drug uptake into the blood. However, it found that only one expert, Dr. Amidon, had "endorsed Alza's subjective comparison of blood plasma levels with *in vivo* release rates." As for that one expert, moreover, he "rejected the very conclusion that Alza attributed to him."

[2] Alza criticizes the district court for "fail[ing] to come to grips with the significance of the testimony" that Dr. Amidon "recanted ...immediately after he made it." Specifically, Alza urges that notwithstanding the expert's recantation, we should nonetheless draw our independent conclusions from the "point of his testimony" that release rates in blood and the appearance in the GI tract are essentially the same. We have considered Alza's arguments and find them to lack legal and factual coherency. Even if we were to presume to be experts and to apply the simplifying assumption that the drug is rapidly taken up into the bloodstream upon dissolution, it is not clear to us how to abstract from each plasma concentration versus time curve the rate of uptake into the bloodstream. This would require factoring out of the curve the effects, *inter alia*, of the elimination of drug from the bloodstream over the relevant 24 hour period. But this is not our province. Such evidence, if it exists, must have been presented at trial, or in its stead other evidence sufficient to persuade the trial court.

From what can be discerned, Dr. Amidon's immediately recanted statement appears to have been based on his comparison of the relative areas under the curves of plasma concentration versus time plots of both the accused ANDA formulation and Ditropan XL. Indeed, Alza reproduces in its appellate brief Dr. Amidon's testimony that the accused product has only 92 to 93 percent of the area under the curve of Ditropan XL. This appears to have resulted in the drawing of a line (referred to by the parties as "line A") on a plot of *in vitro* dissolution of both Ditropan XL and the accused ANDA formulation, wherein the rate of *in vitro* dissolution of Mylan's ANDA formulation has been adjusted according to that percentage. The

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basis for, and significance of, line A is simply not apparent from the record, and Alza fails to provide us with any persuasive line of argument as to how we should imbue line A with any relevant meaning. In short, we agree with Mylan that the plasma concentration versus time data fail to establish *in vivo* release rates for either Ditropan XL or the accused ANDA product.

The district court similarly found unpersuasive Alza's evidence that Ditropan XL and the accused ANDA product sometimes exhibited *in vitro* dissolution rates falling within the claims. The court cited testimony by Dr. Amidon explaining that these *in vitro* procedures are "not designed to reflect the *in vivo* dissolution process." This accords with the common sense notion that one cannot simply proclaim without proof that he has constructed an apparatus capable of mimicking pertinent environmental variables of the GI tract (along the length of the tract, nonetheless). Indeed, the obtained *in vitro* dissolution rates vary widely with the choice of experimental parameters. We agree with the district court that Alza's evidence of *in vitro* dissolution rates is irrelevant absent evidence demonstrating that the *in vitro* system is a good model of actual *in vivo* behavior. On that point, Alza's evidence is severely lacking.

We therefore affirm the district court's finding of noninfringement. In so doing we explicitly reject Alza's suggestion that the district court erred in failing to specifically state that not only did it find Alza's plasma concentration data and its "*in vitro*" data to be inadequate in isolation, but that it had also found the data to be inadequate in combination. Even if we were to entertain the suggestion

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that the district court was in fact unfamiliar with the basic precept that it is the totality of the evidence that it must consider in making factual determinations, we would merely conclude that where as here, if each of two pieces of evidence, assessed separately, is severely inadequate to support a proposition, when their probative values are tallied, they still fall short. While it is possible to envision cases in which two pieces of evidence may create great probative value synergistically, this is not one of those cases.

In conclusion, we affirm the judgment of the district court that the asserted claims of the '355 patent were invalid, and that notwithstanding, the patent was not infringed.

AFFIRMED.

Costs to Mylan.

- End of Case -

EXHIBIT B



UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS
UNITED STATES PATENT AND TRADEMARK OFFICE
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MEMORANDUM

DATE: May 3, 2007

TO: Technology Center Directors
Margaret A. Focarino
FROM: Margaret A. Focarino
Deputy Commissioner
for Patent Operations

SUBJECT: Supreme Court decision on *KSR Int'l. Co., v. Teleflex, Inc.*

The Supreme Court has issued its opinion in *KSR*, regarding the issue of obviousness under 35 U.S.C. § 103(a) when the claim recites a combination of elements of the prior art. *KSR Int'l Co. v. Teleflex, Inc.*, No 04-1350 (U.S. Apr. 30, 2007). A copy of the decision is available at <http://www.supremecourtus.gov/opinions/06pdf/04-1350.pdf>. The Office is studying the opinion and will issue guidance to the patent examining corps in view of the *KSR* decision in the near future. Until the guidance is issued, the following points should be noted:

- (1) The Court reaffirmed the *Graham* factors in the determination of obviousness under 35 U.S.C. § 103(a). The four factual inquiries under *Graham* are:
 - (a) determining the scope and contents of the prior art;
 - (b) ascertaining the differences between the prior art and the claims in issue;
 - (c) resolving the level of ordinary skill in the pertinent art; and
 - (d) evaluating evidence of secondary consideration.

Graham v. John Deere, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966).

- (2) The Court did not totally reject the use of “teaching, suggestion, or motivation” as a factor in the obviousness analysis. Rather, the Court recognized that a showing of “teaching, suggestion, or motivation” to combine the prior art to meet the claimed subject matter could provide a helpful insight in determining whether the claimed subject matter is obvious under 35 U.S.C. § 103(a).

- (3) The Court rejected a rigid application of the “teaching, suggestion, or motivation” (TSM) test, which required a showing of some teaching, suggestion, or motivation in the prior art that would lead one of ordinary skill in the art to combine the prior art elements in the manner claimed in the application or patent before holding the claimed subject matter to be obvious.

(4) The Court noted that the analysis supporting a rejection under 35 U.S.C. § 103(a) should be made explicit, and that it was “important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements” in the manner claimed. The Court specifically stated:

Often, it will be necessary . . . to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an **apparent reason** to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis **should be made explicit**.

KSR, slip op. at 14 (emphasis added).

Therefore, in formulating a rejection under 35 U.S.C. § 103(a) based upon a combination of prior art elements, it remains necessary to identify the reason why a person of ordinary skill in the art would have combined the prior art elements in the manner claimed.

EXHIBIT C

Source: USPQ, 2d Series (1986 - Present) > U.S. Supreme Court > KSR International Co. v. Teleflex Inc., 82 USPQ2d 1385 (U.S. 2007)

KSR International Co. v. Teleflex Inc., 82 USPQ2d 1385 (U.S. 2007)

82 USPQ2d 1385

KSR International Co. v. Teleflex Inc.
U.S. Supreme Court

No. 04-1350

Decided April 30, 2007

Headnotes

PATENTS

[1] Patentability/Validity — Obviousness — Combining references (►115.0905)

Rigid application of "teaching, suggestion, or motivation" test, under which patent claim is proved obvious only if prior art, nature of problem addressed by inventor, or knowledge of person having ordinary skill in art reveals some motivation or suggestion to combine prior art teachings, is inconsistent with expansive and flexible "functional approach" to resolution of obviousness issue, under which scope and content of prior art are determined, differences between prior art and claims at issue are ascertained, level of ordinary skill in pertinent art is resolved, and secondary considerations such as commercial success, long felt but unsolved needs, and failure of others may be considered if doing so would prove instructive; rigid TSM approach is therefore rejected.

[2] Patentability/Validity — Obviousness — Combining references (►115.0905)

Patentability/Validity — Obviousness — Evidence of (►115.0906)

Variations of particular work available in one field of endeavor may be prompted by design incentives and other market forces, either in same field or different one, and if person of ordinary skill in art can implement predictable variation, 35 U.S.C. § 103 likely bars its patentability; similarly, if particular technique has been used to improve one device, and person of ordinary skill would recognize that it would improve similar devices in same way, then using that technique is obvious unless its actual application is beyond person's skill, and court resolving obviousness issue therefore must ask whether improvement is more than predictable use of prior art elements according to their established functions.

[3] Patentability/Validity — Obviousness — Combining references (►115.0905)

Patentability/Validity — Obviousness — Evidence of (►115.0906)

Court determining whether claimed combination of elements known in prior art would have been obvious will often be required to look to interrelated teachings of multiple patents, effects of demands known to design community or present in marketplace, and background knowledge of person of ordinary skill in art in order to determine whether there was apparent reason to combine known elements in manner claimed in patent in suit, and in order to facilitate review, this analysis should be made explicit; however, such analysis need not seek out precise teachings directed to specific subject matter of challenged claim, since court can take account of inferences and creative steps that person of ordinary skill in art would employ.

[4] Patentability/Validity — Obviousness — Combining references (►115.0905)

Idea underlying "teaching, suggestion, or motivation" test, under which patent claim is proved obvious

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only if prior art, nature of problem addressed by inventor, or knowledge of person having ordinary skill in art reveals some motivation or suggestion to combine prior art teachings, is not necessarily inconsistent with expansive and flexible "functional approach" to resolution of obviousness issue, since TSM test is based on helpful insights, namely, that patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in prior art, and that it can be important to identify reason that would have prompted person of ordinary skill in art to combine elements in manner claimed by new invention; however, it is error to apply TSM test as rigid and mandatory formula that limits obviousness analysis through formalistic conception of words "teaching," "suggestion," and "motivation," or by overemphasis on importance of published articles and explicit content of issued patents, since market demand, rather than scientific literature, often drives design trends, and granting patent protection to advances that would occur "in the ordinary course" without real innovation retards progress and may, in case of patents

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combining previously known elements, deprive prior inventions of their value or utility.

[5] Patentability/Validity — Obviousness — Combining references (►115.0905)

Narrow conception of obviousness inquiry, reflected in appellate court's application of "teaching, suggestion, or motivation" test, resulted in erroneous conclusion that summary judgment of obviousness should be vacated, since decision was based on erroneous holding that courts and patent examiners should look only to problem that patentee was trying to solve, and on erroneous assumption that person of ordinary skill in art attempting to solve problem will be led only to those elements of prior art designed to solve same problem, since court erroneously concluded that patent claim cannot be proved obvious merely by showing that combination of elements was "obvious to try," and since appellate court drew wrong conclusion from risk of courts and patent examiners falling prey to "hindsight" bias, in that rigid application of preventative rules that deny fact finders recourse to common sense are neither necessary nor consistent with precedent.

[6] Patentability/Validity — Obviousness — Combining references (►115.0905)

Patentability/Validity — Obviousness — Evidence of (►115.0906)

Fact that claimed combination of elements was "obvious to try" might show that such combination was obvious under 35 U.S.C. § 103, since, if there is design need or market pressure to solve problem, and there are finite number of identified, predictable solutions, person of ordinary skill in art has good reason to pursue known options within his or her technical grasp, and if this leads to anticipated success, it is likely product of ordinary skill and common sense, not innovation.

[7] Patentability/Validity — Obviousness — Relevant prior art — Particular inventions (►115.0903.03)

Patentability/Validity — Obviousness — Combining references (►115.0905)

Asserted claim of patent for position-adjustable vehicle pedal assembly having electronic pedal-position sensor attached to fixed pivot point is invalid as obvious over combination of prior art references, since prior art patent discloses support structure for adjustable pedal assembly in which one pivot point stays fixed, since, at relevant time, marketplace had created strong incentive to convert mechanical pedals to those employing electronic sensors, and pedal designer of ordinary skill would have seen benefit in upgrading device of prior patent with sensor required by new engines using computer-controlled throttles, since other prior art references taught utility of placing sensor on pedal's support structure rather than on footpad, and on nonmoving part of pedal structure, since most obvious nonmoving point on structure from which sensor can easily detect pedal position is fixed pivot point, and since designer seeking to avoid wire-chafing problems with electronic adjustable pedals would have known to employ adjustable pedal with fixed pivot disclosed by prior art patent; declaration submitted by patentees does not indicate that

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device of prior patent was so flawed that there was no reason to upgrade it to be compatible with modern engines, and patentees have shown no secondary considerations to dislodge obviousness determination.

[8] Patentability/Validity — Obviousness — Evidence of (►115.0906)

JUDICIAL PRACTICE AND PROCEDURE

Procedure — Summary judgment — Patents (►410.3303)

Procedure — Evidence — Expert testimony (►410.3703)

Party's submission of conclusory expert affidavit addressing issue of obviousness in patent action does not preclude summary judgment, even though federal district court can and should take into account expert testimony, which may resolve or keep open certain questions of fact, since ultimate judgment of obviousness is legal determination; in present case, in which content of prior art, scope of asserted claim, and level of ordinary skill in art were not in material dispute, and obviousness of claim was apparent from these factors, summary judgment was appropriate, and nothing in declarations proffered by patentees prevented district court from reaching conclusions underlying its order for summary judgment of obviousness.

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Particular Patents

Particular patents — General and mechanical — Vehicle control pedal assembly

6,237,565, Engelgau, adjustable pedal assembly with electronic throttle control, invalid for obviousness.

Case History and Disposition

On writ of certiorari to the U.S. Court of Appeals for the Federal Circuit, Schall, J.

Action by Teleflex Inc. and Technology Holding Co. against KSR International Co. for patent infringement. The U.S. District Court for the Eastern District of Michigan granted summary judgment in favor of defendant on ground that patent in suit was invalid for obviousness, and plaintiffs appealed. Grant of summary judgment was vacated and remanded, and defendant-appellee filed petition for writ of certiorari. Reversed and remanded.

Attorneys

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Syllabus

Syllabus by the Court.

To control a conventional automobile's speed, the driver depresses or releases the gas pedal, which interacts with the throttle via a cable or other mechanical link. Because the pedal's position in the footwell normally cannot be adjusted, a driver wishing to be closer or farther from it must either reposition himself in the seat or move the seat, both of which can be imperfect solutions for smaller drivers in cars with deep footwells. This prompted inventors to design and patent pedals that could be adjusted to change their locations. The Asano patent reveals a support structure whereby, when the pedal location is adjusted, one of the pedal's pivot points stays fixed. Asano is also designed so that the force necessary to depress the pedal is the same regardless of location adjustments. The Redding patent reveals a different, sliding mechanism where both the pedal and the pivot point are adjusted.

In newer cars, computer-controlled throttles do not operate through force transferred from the pedal by a mechanical link, but open and close valves in response to electronic signals. For the computer to know what is happening with the pedal, an electronic sensor must translate the mechanical operation into digital data. Inventors had obtained a number of patents for such sensors. The so-called '936 patent taught that it was preferable to detect the pedal's position in the pedal mechanism, not in the engine, so the patent disclosed a pedal with an electronic sensor on a pivot point in the pedal assembly. The Smith patent taught that to prevent the wires connecting the sensor to the computer from chafing and wearing out, the sensor should be put on a fixed part of the pedal assembly rather than in or on the pedal's footpad. Inventors had also patented self-contained modular sensors, which can be taken off the shelf and attached to any mechanical pedal to allow it to function with a computer-controlled throttle. The '068 patent disclosed one such sensor. Chevrolet also manufactured trucks using modular sensors attached to the pedal support bracket, adjacent to the pedal and engaged with the pivot shaft about which the pedal rotates. Other patents disclose electronic sensors attached to adjustable pedal assemblies. For example, the Rixon patent locates the sensor in the pedal footpad, but is known for wire chafing.

After petitioner KSR developed an adjustable pedal system for cars with cable-actuated throttles and obtained its '976 patent for the design, General Motors Corporation (GMC) chose KSR to supply adjustable pedal systems for trucks using computer-controlled throttles. To make the '976 pedal compatible with the trucks, KSR added a modular sensor to its design. Respondents (Teleflex) hold the exclusive license for the Engelgau patent, claim 4 of which discloses a position-adjustable pedal assembly with an electronic pedal position sensor attached at a fixed pivot point. Despite having denied a similar, broader claim, the

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U.S. Patent and Trademark Office (PTO) had allowed claim 4 because it included the limitation of a fixed pivot position, which distinguished the design from Redding's. Asano was neither included among the Engelgau patent's prior art references nor mentioned in the patent's prosecution, and the PTO did not have before it an adjustable pedal with a fixed pivot point. After learning of KSR's design for GMC, Teleflex sued for infringement, asserting that KSR's pedal system infringed the Engelgau patent's claim 4. KSR countered that claim 4 was invalid under § 103 of the Patent Act, which forbids issuance of a patent when "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art."

Graham v. John Deere Co. of Kansas City, 383 U.S. 1, 17–18 [148 USPQ 459], set out an objective analysis for applying § 103: "[T]he scope and content of the prior art are ... determined; differences between the prior art and the claims at issue are ... ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented." While the sequence of these questions might be reordered in any particular case, the factors define the controlling inquiry. However, seeking to resolve the obviousness question with more uniformity and consistency, the Federal Circuit has employed a "teaching, suggestion,

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or motivation" (TSM) test, under which a patent claim is only proved obvious if the prior art, the problem's nature, or the knowledge of a person having ordinary skill in the art reveals some motivation or suggestion to combine the prior art teachings.

The District Court granted KSR summary judgment. After reviewing pedal design history, the Engelgau patent's scope, and the relevant prior art, the court considered claim 4's validity, applying *Graham's* framework to determine whether under summary-judgment standards KSR had demonstrated that claim 4 was obvious. The court found "little difference" between the prior art's teachings and claim 4: Asano taught everything contained in the claim except using a sensor to detect the pedal's position and transmit it to a computer controlling the throttle. That additional aspect was revealed in, e.g., the '068 patent and Chevrolet's sensors. The court then held that KSR satisfied the TSM test, reasoning (1) the state of the industry would lead inevitably to combinations of electronic sensors and adjustable pedals, (2) Rixon provided the basis for these developments, and (3) Smith taught a solution to Rixon's chafing problems by positioning the sensor on the pedal's fixed structure, which could lead to the combination of a pedal like Asano with a pedal position sensor.

Reversing, the Federal Circuit ruled the District Court had not applied the TSM test strictly enough, having failed to make findings as to the specific understanding or principle within a skilled artisan's knowledge that would have motivated one with no knowledge of the invention to attach an electronic control to the Asano assembly's support bracket. The Court of Appeals held that the District Court's recourse to the nature of the problem to be solved was insufficient because, unless the prior art references addressed the precise problem that the patentee was trying to solve, the problem would not motivate an inventor to look at those references. The appeals court found that the Asano pedal was designed to ensure that the force required to depress the pedal is the same no matter how the pedal is adjusted, whereas Engelgau sought to provide a simpler, smaller, cheaper adjustable electronic pedal. The Rixon pedal, said the court, suffered from chafing but was not designed to solve that problem and taught nothing helpful to Engelgau's purpose. Smith, in turn, did not relate to adjustable pedals and did not necessarily go to the issue of motivation to attach the electronic control on the pedal assembly's support bracket. So interpreted, the court held, the patents would not have led a person of ordinary skill to put a sensor on an Asano-like pedal. That it might have been obvious to try that combination was likewise irrelevant. Finally, the court held that genuine issues of material fact precluded summary judgment.

Held: The Federal Circuit addressed the obviousness question in a narrow, rigid manner that is inconsistent with § 103 and this Court's precedents. KSR provided convincing evidence that mounting an available sensor on a

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fixed pivot point of the Asano pedal was a design step well within the grasp of a person of ordinary skill in the relevant art and that the benefit of doing so would be obvious. Its arguments, and the record, demonstrate that the Engelgau patent's claim 4 is obvious. Pp. 11–24.

1. *Graham* provided an expansive and flexible approach to the obviousness question that is inconsistent with the way the Federal Circuit applied its TSM test here. Neither § 103's enactment nor *Graham's* analysis disturbed the Court's earlier instructions concerning the need for caution in granting a patent based on the combination of elements found in the prior art. See *Great Atlantic & Pacific Tea Co. v. Supermarket Equipment Corp.*, 340 U.S. 147, 152 [87 USPQ 303]. Such a combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results. See, e.g., *United States v. Adams*, 383 U.S. 39, 50–52 [148 USPQ 479]. When a work is available in one field, design incentives and other market forces can prompt variations of it, either in the same field or in another. If a person of ordinary skill in the art can implement a predictable variation, and would see the benefit of doing so, § 103 likely bars its patentability. Moreover, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond that person's skill. A court must ask whether the improvement is more than the predictable use of prior-art elements according to their established functions. Following these principles may be difficult if the claimed

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subject matter involves more than the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement. To determine whether there was an apparent reason to combine the known elements in the way a patent claims, it will often be necessary to look to interrelated teachings of multiple patents; to the effects of demands known to the design community or present in the marketplace; and to the background knowledge possessed by a person having ordinary skill in the art. To facilitate review, this analysis should be made explicit. But it need not seek out precise teachings directed to the challenged claim's specific subject matter, for a court can consider the inferences and creative steps a person of ordinary skill in the art would employ. Pp. 11–14.

(b) The TSM test captures a helpful insight: A patent composed of several elements is not proved obvious merely by demonstrating that each element was, independently, known in the prior art. Although common sense directs caution as to a patent application claiming as innovation the combination of two known devices according to their established functions, it can be important to identify a reason that would have prompted a person of ordinary skill in the art to combine the elements as the new invention does. Inventions usually rely upon building blocks long since uncovered, and claimed discoveries almost necessarily will be combinations of what, in some sense, is already known. Helpful insights, however, need not become rigid and mandatory formulas. If it is so applied, the TSM test is incompatible with this Court's precedents. The diversity of inventive pursuits and of modern technology counsels against confining the obviousness analysis by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasizing the importance of published articles and the explicit content of issued patents. In many fields there may be little discussion of obvious techniques or combinations, and market demand, rather than scientific literature, may often drive design trends. Granting patent protection to advances that would occur in the ordinary course without real innovation retards progress and may, for patents combining previously known elements, deprive prior inventions of their value or utility. Since the TSM test was devised, the Federal Circuit doubtless has applied it in accord with these principles in many cases. There is no necessary inconsistency between the test and the *Graham* analysis. But a court errs where, as here, it transforms general principle into a rigid rule limiting the obviousness inquiry. Pp. 14–15.

(c) The flaws in the Federal Circuit's analysis relate mostly to its narrow conception of the obviousness inquiry consequent in its application of the TSM test. The Circuit first erred in holding that courts and patent examiners should look only to the problem the patentee was trying to solve. Under the correct analysis, any need or problem known in the field and addressed by the patent can provide a reason for combining the elements in the

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manner claimed. Second, the appeals court erred in assuming that a person of ordinary skill in the art attempting to solve a problem will be led only to those prior art elements designed to solve the same problem. The court wrongly concluded that because Asano's primary purpose was solving the constant ratio problem, an inventor considering how to put a sensor on an adjustable pedal would have no reason to consider putting it on the Asano pedal. It is common sense that familiar items may have obvious uses beyond their primary purposes, and a person of ordinary skill often will be able to fit the teachings of multiple patents together like pieces of a puzzle. Regardless of Asano's primary purpose, it provided an obvious example of an adjustable pedal with a fixed pivot point, and the prior art was replete with patents indicating that such a point was an ideal mount for a sensor. Third, the court erred in concluding that a patent claim cannot be proved obvious merely by showing that the combination of elements was obvious to try. When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill in the art has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. Finally, the court drew the wrong conclusion from the risk of courts and patent examiners falling prey to hindsight bias. Rigid preventative rules that deny recourse to common sense are neither necessary under, nor consistent with, this Court's case law. Pp. 15–18.

2. Application of the foregoing standards demonstrates that claim 4 is obvious. Pp. 18–23.

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(a) The Court rejects Teleflex's argument that the Asano pivot mechanism's design prevents its combination with a sensor in the manner claim 4 describes. This argument was not raised before the District Court, and it is unclear whether it was raised before the Federal Circuit. Given the significance of the District Court's finding that combining Asano with a pivot-mounted pedal position sensor fell within claim 4's scope, it is apparent that Teleflex would have made clearer challenges if it intended to preserve this claim. Its failure to clearly raise the argument, and the appeals court's silence on the issue, lead this Court to accept the District Court's conclusion. Pp. 18–20.

(b) The District Court correctly concluded that when Engelgau designed the claim 4 subject matter, it was obvious to a person of ordinary skill in the art to combine Asano with a pivot-mounted pedal position sensor. There then was a marketplace creating a strong incentive to convert mechanical pedals to electronic pedals, and the prior art taught a number of methods for doing so. The Federal Circuit considered the issue too narrowly by, in effect, asking whether a pedal designer writing on a blank slate would have chosen both Asano and a modular sensor similar to the ones used in the Chevrolet trucks and disclosed in the '068 patent. The proper question was whether a pedal designer of ordinary skill in the art, facing the wide range of needs created by developments in the field, would have seen an obvious benefit to upgrading Asano with a sensor. For such a designer starting with Asano, the question was where to attach the sensor. The '936 patent taught the utility of putting the sensor on the pedal device. Smith, in turn, explained not to put the sensor on the pedal footpad, but instead on the structure. And from Rixon's known wire-chafing problems, and Smith's teaching that the pedal assemblies must not precipitate any motion in the connecting wires, the designer would know to place the sensor on a nonmoving part of the pedal structure. The most obvious such point is a pivot point. The designer, accordingly, would follow Smith in mounting the sensor there. Just as it was possible to begin with the objective to upgrade Asano to work with a computer-controlled throttle, so too was it possible to take an adjustable electronic pedal like Rixon and seek an improvement that would avoid the wire-chafing problem. Teleflex has not shown anything in the prior art that taught away from the use of Asano, nor any secondary factors to dislodge the determination that claim 4 is obvious. Pp. 20–23.

3. The Court disagrees with the Federal Circuit's holding that genuine issues of material fact precluded summary judgment. The ultimate judgment of obviousness is a legal determination. *Graham*, 383 U.S., at 17. Where, as here, the prior art's content, the patent claim's scope, and the level of ordinary skill in the art are not in material dispute and the claim's obviousness

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is apparent, summary judgment is appropriate. P. 23.

119 Fed. Appx. 282, reversed and remanded.

Kennedy, J., delivered the opinion for a unanimous Court.

Opinion Text

Opinion By:

Kennedy, J.

Teleflex Incorporated and its subsidiary Technology Holding Company—both referred to here as Teleflex—sued KSR International Company for patent infringement. The patent at issue, United States Patent No. 6,237,565 B1, is entitled “Adjustable Pedal Assembly With Electronic Throttle Control.” Supplemental App. 1. The patentee is Steven J. Engelgau, and the patent is referred to as “the Engelgau patent.” Teleflex holds the exclusive license to the patent.

Claim 4 of the Engelgau patent describes a mechanism for combining an electronic sensor with an

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adjustable automobile pedal so the pedal's position can be transmitted to a computer that controls the throttle in the vehicle's engine. When Teleflex accused KSR of infringing the Engelgau patent by adding an electronic sensor to one of KSR's previously designed pedals, KSR countered that claim 4 was invalid under the Patent Act, 35 U.S.C. § 103, because its subject matter was obvious.

Section 103 forbids issuance of a patent when "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains."

In *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 [148 USPQ 459] (1966), the Court set out a framework for applying the statutory language of § 103, language itself based on the logic of the earlier decision in *Hotchkiss v. Greenwood*, 11 How. 248 (1851), and its progeny. See 383 U.S., at 15–17. The analysis is objective:

"Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented." *Id.*, at 17–18.

While the sequence of these questions might be reordered in any particular case, the factors continue to define the inquiry that controls. If a court, or patent examiner, conducts this analysis and concludes the claimed subject matter was obvious, the claim is invalid under § 103.

Seeking to resolve the question of obviousness with more uniformity and consistency, the Court of Appeals for the Federal Circuit has employed an approach referred to by the parties as the "teaching, suggestion, or motivation" test (TSM test), under which a patent claim is only proved obvious if "some motivation or suggestion to combine the prior art teachings" can be found in the prior art, the nature of the problem, or the knowledge of a person having ordinary skill in the art. See, e.g., *Al-Site Corp. v. VSI Int'l, Inc.*, 174 F.3d 1308, 1323–1324 [50 USPQ2d 1161] (CA Fed. 1999). KSR challenges that test, or at least its application in this case. See 119 Fed. Appx. 282, 286–290 (CA Fed. 2005). Because the Court of Appeals addressed the question of obviousness in a manner contrary to § 103 and our precedents, we granted certiorari, 547 U.S. ____ (2006). We now reverse.

I

A

In car engines without computer-controlled throttles, the accelerator pedal interacts with the throttle via cable or other mechanical link. The pedal arm acts as a lever rotating around a pivot point. In a cable-actuated throttle control the rotation caused by pushing down the pedal pulls a cable, which in turn pulls open valves in the carburetor or fuel injection unit. The wider the valves open, the more fuel and air are released, causing combustion to increase and the car to accelerate. When the driver takes his foot off the pedal, the opposite occurs as the cable is released and the valves slide closed.

In the 1990's it became more common to install computers in cars to control engine operation. Computer-controlled throttles open and close valves in response to electronic signals, not through force transferred from the pedal by a mechanical link. Constant, delicate

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adjustments of air and fuel mixture are possible. The computer's rapid processing of factors beyond the pedal's position improves fuel efficiency and engine performance.

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For a computer-controlled throttle to respond to a driver's operation of the car, the computer must know what is happening with the pedal. A cable or mechanical link does not suffice for this purpose; at some point, an electronic sensor is necessary to translate the mechanical operation into digital data the computer can understand.

Before discussing sensors further we turn to the mechanical design of the pedal itself. In the traditional design a pedal can be pushed down or released but cannot have its position in the footwell adjusted by sliding the pedal forward or back. As a result, a driver who wishes to be closer or farther from the pedal must either reposition himself in the driver's seat or move the seat in some way. In cars with deep footwells these are imperfect solutions for drivers of smaller stature. To solve the problem, inventors, beginning in the 1970's, designed pedals that could be adjusted to change their location in the footwell. Important for this case are two adjustable pedals disclosed in U.S. Patent Nos. 5,010,782 (filed July 28, 1989) (Asano) and 5,460,061 (filed Sept. 17, 1993) (Redding). The Asano patent reveals a support structure that houses the pedal so that even when the pedal location is adjusted relative to the driver, one of the pedal's pivot points stays fixed. The pedal is also designed so that the force necessary to push the pedal down is the same regardless of adjustments to its location. The Redding patent reveals a different, sliding mechanism where both the pedal and the pivot point are adjusted.

We return to sensors. Well before Engelgau applied for his challenged patent, some inventors had obtained patents involving electronic pedal sensors for computer-controlled throttles. These inventions, such as the device disclosed in U.S. Patent No. 5,241,936 (filed Sept. 9, 1991) ('936), taught that it was preferable to detect the pedal's position in the pedal assembly, not in the engine. The '936 patent disclosed a pedal with an electronic sensor on a pivot point in the pedal assembly. U.S. Patent No. 5,063,811 (filed July 9, 1990) (Smith) taught that to prevent the wires connecting the sensor to the computer from chafing and wearing out, and to avoid grime and damage from the driver's foot, the sensor should be put on a fixed part of the pedal assembly rather than in or on the pedal's footpad.

In addition to patents for pedals with integrated sensors inventors obtained patents for self-contained modular sensors. A modular sensor is designed independently of a given pedal so that it can be taken off the shelf and attached to mechanical pedals of various sorts, enabling the pedals to be used in automobiles with computer-controlled throttles. One such sensor was disclosed in U.S. Patent No. 5,385,068 (filed Dec. 18, 1992) ('068). In 1994, Chevrolet manufactured a line of trucks using modular sensors "attached to the pedal support bracket, adjacent to the pedal and engaged with the pivot shaft about which the pedal rotates in operation." 298 F.Supp.2d 581, 589 (ED Mich. 2003).

The prior art contained patents involving the placement of sensors on adjustable pedals as well. For example, U.S. Patent No. 5,819,593 (filed Aug. 17, 1995) (Rixon) discloses an adjustable pedal assembly with an electronic sensor for detecting the pedal's position. In the Rixon pedal the sensor is located in the pedal footpad. The Rixon pedal was known to suffer from wire chafing when the pedal was depressed and released.

This short account of pedal and sensor technology leads to the instant case.

B

KSR, a Canadian company, manufactures and supplies auto parts, including pedal systems. Ford Motor Company hired KSR in 1998 to supply an adjustable pedal system for various lines of automobiles with cable-actuated throttle controls. KSR developed an adjustable mechanical pedal for Ford and obtained U.S. Patent No. 6,151,976 (filed July 16, 1999) ('976) for the design. In 2000, KSR was chosen by General Motors Corporation (GMC or GM) to supply adjustable pedal systems for Chevrolet and GMC light trucks that used engines with computer-controlled throttles. To make the '976 pedal compatible with the trucks, KSR merely took that design and added a modular sensor.

Teleflex is a rival to KSR in the design and manufacture of adjustable pedals. As noted, it is the exclusive licensee of the Engelgau patent. Engelgau filed the patent application on August 22, 2000 as a

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continuation of a previous

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application for U.S. Patent No. 6,109,241, which was filed on January 26, 1999. He has sworn he invented the patent's subject matter on February 14, 1998. The Engelgau patent discloses an adjustable electronic pedal described in the specification as a "simplified vehicle control pedal assembly that is less expensive, and which uses fewer parts and is easier to package within the vehicle." Engelgau, col. 2, lines 2–5, Supplemental App. 6. Claim 4 of the patent, at issue here, describes:

"A vehicle control pedal apparatus comprising:
a support adapted to be mounted to a vehicle structure;
an adjustable pedal assembly having a pedal arm moveable in for[e] and aft directions with respect to said support;
a pivot for pivotally supporting said adjustable pedal assembly with respect to said support and defining a pivot axis; and
an electronic control attached to said support for controlling a vehicle system;
said apparatus characterized by said electronic control being responsive to said pivot for providing a signal that corresponds to pedal arm position as said pedal arm pivots about said pivot axis between rest and applied positions wherein the position of said pivot remains constant while said pedal arm moves in fore and aft directions with respect to said pivot." *Id.*, col. 6, lines 17–36, Supplemental App. 8 (diagram numbers omitted).

We agree with the District Court that the claim discloses "a position-adjustable pedal assembly with an electronic pedal position sensor attached to the support member of the pedal assembly. Attaching the sensor to the support member allows the sensor to remain in a fixed position while the driver adjusts the pedal." 298 F.Supp.2d, at 586–587.

Before issuing the Engelgau patent the U.S. Patent and Trademark Office (PTO) rejected one of the patent claims that was similar to, but broader than, the present claim 4. The claim did not include the requirement that the sensor be placed on a fixed pivot point. The PTO concluded the claim was an obvious combination of the prior art disclosed in Redding and Smith, explaining:

" 'Since the prior art[es] references are from the field of endeavor, the purpose disclosed ... would have been recognized in the pertinent art of Redding. Therefore it would have been obvious ... to provide the device of Redding with the ... means attached to a support member as taught by Smith.' " *Id.*, at 595.

In other words Redding provided an example of an adjustable pedal and Smith explained how to mount a sensor on a pedal's support structure, and the rejected patent claim merely put these two teachings together.

Although the broader claim was rejected, claim 4 was later allowed because it included the limitation of a fixed pivot point, which distinguished the design from Redding's. *Id.* Engelgau had not included Asano among the prior art references, and Asano was not mentioned in the patent's prosecution. Thus, the PTO did not have before it an adjustable pedal with a fixed pivot point. The patent issued on May 29, 2001 and was assigned to Teleflex.

Upon learning of KSR's design for GM, Teleflex sent a warning letter informing KSR that its proposal would violate the Engelgau patent. " 'Teleflex believes that any supplier of a product that combines an adjustable pedal with an electronic throttle control necessarily employs technology covered by one or more' " of Teleflex's patents. *Id.*, at 585. KSR refused to enter a royalty arrangement with Teleflex; so

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Teleflex sued for infringement, asserting KSR's pedal infringed the Engelgau patent and two other patents. *Ibid.* Teleflex later abandoned its claims regarding the other patents and dedicated the patents to the public. The remaining contention was that KSR's pedal system for GM infringed claim 4 of the Engelgau patent. Teleflex has not argued that the other three claims of the patent are infringed by KSR's pedal, nor has Teleflex argued that the mechanical adjustable pedal designed by KSR for Ford infringed any of its patents.

C

The District Court granted summary judgment in KSR's favor. After reviewing the pertinent history of pedal design, the scope of the Engelgau patent, and the relevant prior art, the court considered the validity of the contested claim. By direction of 35 U.S.C. § 282, an issued patent is presumed valid. The District Court applied *Graham's* framework to determine

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whether under summary-judgment standards KSR had overcome the presumption and demonstrated that claim 4 was obvious in light of the prior art in existence when the claimed subject matter was invented. See § 102(a).

The District Court determined, in light of the expert testimony and the parties' stipulations, that the level of ordinary skill in pedal design was " 'an undergraduate degree in mechanical engineering (or an equivalent amount of industry experience) [and]familiarity with pedal control systems for vehicles.' "298 F.Supp.2d, at 590. The court then set forth the relevant prior art, including the patents and pedal designs described above.

Following *Graham's* direction, the court compared the teachings of the prior art to the claims of Engelgau. It found "little difference." 298 F.Supp.2d, at 590. Asano taught everything contained in claim 4 except the use of a sensor to detect the pedal's position and transmit it to the computer controlling the throttle. That additional aspect was revealed in sources such as the '068 patent and the sensors used by Chevrolet.

Under the controlling cases from the Court of Appeals for the Federal Circuit, however, the District Court was not permitted to stop there. The court was required also to apply the TSM test. The District Court held KSR had satisfied the test. It reasoned (1) the state of the industry would lead inevitably to combinations of electronic sensors and adjustable pedals, (2) Rixon provided the basis for these developments, and (3)Smith taught a solution to the wire chafing problems in Rixon, namely locating the sensor on the fixed structure of the pedal. This could lead to the combination of Asano, or a pedal like it, with a pedal position sensor.

The conclusion that the Engelgau design was obvious was supported, in the District Court's view, by the PTO's rejection of the broader version of claim 4. Had Engelgau included Asano in his patent application, it reasoned, the PTO would have found claim 4 to be an obvious combination of Asano and Smith, as it had found the broader version an obvious combination of Redding and Smith. As a final matter, the District Court held that the secondary factor of Teleflex's commercial success with pedals based on Engelgau's design did not alter its conclusion. The District Court granted summary judgment for KSR.

With principal reliance on the TSM test, the Court of Appeals reversed. It ruled the District Court had not been strict enough in applying the test, having failed to make " 'finding[s] as to the specific understanding or principle within the knowledge of a skilled artisan that would have motivated one with no knowledge of [the] invention' ... to attach an electronic control to the support bracket of the Asano assembly." 119 Fed. Appx., at 288 (brackets in original) (quoting *In re Kotzab*, 217 F.3d 1365, 1371 [55 USPQ2d 1313] (CA Fed. 2000)). The Court of Appeals held that the District Court was incorrect that the nature of the problem to be solved satisfied this requirement because unless the "prior art references address[ed]the precise problem that the patentee was trying to solve,"the problem would not motivate an inventor to look at those references. 119 Fed. Appx., at 288.

Here, the Court of Appeals found, the Asano pedal was designed to solve the “ ‘constant ratio problem’”—that is, to ensure that the force required to depress the pedal is the same no matter how the pedal is adjusted—whereas Engelgau sought to provide a simpler, smaller, cheaper adjustable electronic pedal. *Ibid.* As for Rixon, the court explained, that pedal suffered from the problem of wire chafing but was not designed to solve it. In the court’s view Rixon did not teach anything helpful to Engelgau’s purpose. Smith, in turn, did not relate to adjustable pedals and did not “necessarily go to the issue of motivation to attach the electronic control on the support bracket of the pedal assembly.” *Ibid.* When the patents were interpreted in this way, the Court of Appeals held, they would not have led a person of ordinary skill to put a sensor on the sort of pedal described in Asano.

That it might have been obvious to try the combination of Asano and a sensor was likewise irrelevant, in the court’s view, because “ ‘[o]bvious to try’ has long been held not to constitute obviousness.’ ” *Id.*, at 289 (quoting *In re Deuel*, 51 F.3d 1552, 1559 [34 USPQ2d 1210] (CA Fed. 1995)).

The Court of Appeals also faulted the District Court’s consideration of the PTO’s rejection of the broader version of claim 4. The District Court’s role, the Court of Appeals explained, was not to speculate regarding what the PTO might have done had the Engelgau patent mentioned Asano. Rather, the court held, the District Court was obliged first to

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presume that the issued patent was valid and then to render its own independent judgment of obviousness based on a review of the prior art. The fact that the PTO had rejected the broader version of claim 4, the Court of Appeals said, had no place in that analysis.

The Court of Appeals further held that genuine issues of material fact precluded summary judgment. Teleflex had proffered statements from one expert that claim 4 “ ‘was a simple, elegant, and novel combination of features,’ ” 119 Fed. Appx., at 290, compared to Rixon, and from another expert that claim 4 was nonobvious because, unlike in Rixon, the sensor was mounted on the support bracket rather than the pedal itself. This evidence, the court concluded, sufficed to require a trial.

II

A

[1] We begin by rejecting the rigid approach of the Court of Appeals. Throughout this Court’s engagement with the question of obviousness, our cases have set forth an expansive and flexible approach inconsistent with the way the Court of Appeals applied its TSM test here. To be sure, *Graham* recognized the need for “uniformity and definiteness.” 383 U.S., at 18. Yet the principles laid down in *Graham* reaffirmed the “functional approach” of *Hotchkiss*, 11 How. 248. See 383 U.S., at 12. To this end, *Graham* set forth a broad inquiry and invited courts, where appropriate, to look at any secondary considerations that would prove instructive. *Id.*, at 17.

Neither the enactment of § 103 nor the analysis in *Graham* disturbed this Court’s earlier instructions concerning the need for caution in granting a patent based on the combination of elements found in the prior art. For over a half century, the Court has held that a “patent for a combination which only unites old elements with no change in their respective functions ...obviously withdraws what is already known into the field of its monopoly and diminishes the resources available to skillful men.” *Great Atlantic & Pacific Tea Co. v. Supermarket Equipment Corp.*, 340 U.S. 147, 152 [87 USPQ 303] (1950). This is a principal reason for declining to allow patents for what is obvious. The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results. Three cases decided after *Graham* illustrate the application of this doctrine.

In *United States v. Adams*, 383 U.S. 39, 40 [148 USPQ 479](1966), a companion case to *Graham*, the Court considered the obviousness of a “wet battery” that varied from prior designs in two ways: It contained water, rather than the acids conventionally employed in storage batteries; and its electrodes

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were magnesium and cuprous chloride, rather than zinc and silver chloride. The Court recognized that when a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result. 383 U.S., at 50–51. It nevertheless rejected the Government's claim that Adams's battery was obvious. The Court relied upon the corollary principle that when the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be nonobvious. *Id.*, at 51–52. When Adams designed his battery, the prior art warned that risks were involved in using the types of electrodes he employed. The fact that the elements worked together in an unexpected and fruitful manner supported the conclusion that Adams's design was not obvious to those skilled in the art.

In *Anderson's-Black Rock, Inc. v. Pavement Salvage Co.*, 396 U.S. 57 [163 USPQ 673] (1969), the Court elaborated on this approach. The subject matter of the patent before the Court was a device combining two pre-existing elements: a radiant-heat burner and a paving machine. The device, the Court concluded, did not create some new synergy: The radiant-heat burner functioned just as a burner was expected to function; and the paving machine did the same. The two in combination did no more than they would in separate, sequential operation. *Id.*, at 60–62. In those circumstances, “while the combination of old elements performed a useful function, it added nothing to the nature and quality of the radiant-heat burner already patented,” and the patent failed under § 103. *Id.*, at 62 (footnote omitted).

Finally, in *Sakraida v. AG Pro, Inc.*, 425 U.S. 273 [189 USPQ 449] (1976), the Court derived from the precedents the conclusion that when a patent “simply arranges old elements with each performing the same function it had been known to perform” and yields no

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more than one would expect from such an arrangement, the combination is obvious. *Id.*, at 282.

[2] The principles underlying these cases are instructive when the question is whether a patent claiming the combination of elements of prior art is obvious. When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. *Sakraida* and *Anderson's-Black Rock* are illustrative—a court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions.

[3] Following these principles may be more difficult in other cases than it is here because the claimed subject matter may involve more than the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement. Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis should be made explicit. See *In re Kahn*, 441 F.3d 977, 988 [78 USPQ2d 1329] (CA Fed. 2006) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”). As our precedents make clear, however, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.

B

[4] When it first established the requirement of demonstrating a teaching, suggestion, or motivation to combine known elements in order to show that the combination is obvious, the Court of Customs and Patent Appeals captured a helpful insight. See *Application of Bergel*, 292 F.2d 955, 956–957 [130 USPQ

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206](1961). As is clear from cases such as *Adams*, a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. Although common sense directs one to look with care at a patent application that claims as innovation the combination of two known devices according to their established functions, it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does. This is so because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known.

Helpful insights, however, need not become rigid and mandatory formulas; and when it is so applied, the TSM test is incompatible with our precedents. The obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasis on the importance of published articles and the explicit content of issued patents. The diversity of inventive pursuits and of modern technology counsels against limiting the analysis in this way. In many fields it may be that there is little discussion of obvious techniques or combinations, and it often may be the case that market demand, rather than scientific literature, will drive design trends. Granting patent protection to advances that would occur in the ordinary course without real innovation retards progress and may, in the case of patents combining previously known elements, deprive prior inventions of their value or utility.

In the years since the Court of Customs and Patent Appeals set forth the essence of the TSM test, the Court of Appeals no doubt has applied the test in accord with these principles in many cases. There is no necessary inconsistency between the idea underlying the TSM test and the *Graham* analysis. But when a court transforms the general principle into a

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rigid rule that limits the obviousness inquiry, as the Court of Appeals did here, it errs.

C

The flaws in the analysis of the Court of Appeals relate for the most part to the court's narrow conception of the obviousness inquiry reflected in its application of the TSM test. In determining whether the subject matter of a patent claim is obvious, neither the particular motivation nor the avowed purpose of the patentee controls. What matters is the objective reach of the claim. If the claim extends to what is obvious, it is invalid under § 103. One of the ways in which a patent's subject matter can be proved obvious is by noting that there existed at the time of invention a known problem for which there was an obvious solution encompassed by the patent's claims.

[5] The first error of the Court of Appeals in this case was to foreclose this reasoning by holding that courts and patent examiners should look only to the problem the patentee was trying to solve. 119 Fed. Appx., at 288. The Court of Appeals failed to recognize that the problem motivating the patentee may be only one of many addressed by the patent's subject matter. The question is not whether the combination was obvious to the patentee but whether the combination was obvious to a person with ordinary skill in the art. Under the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.

The second error of the Court of Appeals lay in its assumption that a person of ordinary skill attempting to solve a problem will be led only to those elements of prior art designed to solve the same problem. *Ibid.* The primary purpose of Asano was solving the constant ratio problem; so, the court concluded, an inventor considering how to put a sensor on an adjustable pedal would have no reason to consider putting it on the Asano pedal. *Ibid.* Common sense teaches, however, that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle. Regardless of Asano's primary purpose, the design provided an obvious example of an adjustable pedal with a fixed pivot point; and the prior art was replete with patents indicating that a fixed pivot point was an ideal mount for a sensor. The

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idea that a designer hoping to make an adjustable electronic pedal would ignore Asano because Asano was designed to solve the constant ratio problem makes little sense. A person of ordinary skill is also a person of ordinary creativity, not an automaton.

[6] The same constricted analysis led the Court of Appeals to conclude, in error, that a patent claim cannot be proved obvious merely by showing that the combination of elements was "obvious to try." *Id.*, at 289 (internal quotation marks omitted). When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show that it was obvious under § 103.

The Court of Appeals, finally, drew the wrong conclusion from the risk of courts and patent examiners falling prey to hindsight bias. A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning. See *Graham*, 383 U.S., at 36 (warning against a "temptation to read into the prior art the teachings of the invention in issue" and instructing courts to "guard against slipping into the use of hindsight" (quoting *Monroe Auto Equipment Co. v. Heckethorn Mfg. & Supply Co.*, 332 F.2d 406, 412[141 USPQ 549](CA6 1964))). Rigid preventative rules that deny factfinders recourse to common sense, however, are neither necessary under our case law nor consistent with it.

We note the Court of Appeals has since elaborated a broader conception of the TSM test than was applied in the instant matter. See, e.g., *DyStar Textilfarben GmbH & Co. Deutschland KG v. C. H. Patrick Co.*, 464 F.3d 1356, 1367 [80 USPQ2d 1641] (2006) ("Our suggestion test is in actuality quite flexible and not only permits, but *requires*, consideration of common knowledge and common sense"); *Alza Corp. v. Mylan Labs., Inc.*, 464 F.3d 1286, 1291 [80 USPQ2d 1001] (2006) ("There is flexibility in our obviousness jurisprudence because a motivation may be found *implicitly* in the prior art. We do not

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have a rigid test that requires an actual teaching to combine ..."). Those decisions, of course, are not now before us and do not correct the errors of law made by the Court of Appeals in this case. The extent to which they may describe an analysis more consistent with our earlier precedents and our decision here is a matter for the Court of Appeals to consider in its future cases. What we hold is that the fundamental misunderstandings identified above led the Court of Appeals in this case to apply a test inconsistent with our patent law decisions.

III

When we apply the standards we have explained to the instant facts, claim 4 must be found obvious. We agree with and adopt the District Court's recitation of the relevant prior art and its determination of the level of ordinary skill in the field. As did the District Court, we see little difference between the teachings of Asano and Smith and the adjustable electronic pedal disclosed in claim 4 of the Engelgau patent. A person having ordinary skill in the art could have combined Asano with a pedal position sensor in a fashion encompassed by claim 4, and would have seen the benefits of doing so.

A

Teleflex argues in passing that the Asano pedal cannot be combined with a sensor in the manner described by claim 4 because of the design of Asano's pivot mechanisms. See Brief for Respondents 48–49, and n. 17. Therefore, Teleflex reasons, even if adding a sensor to Asano was obvious, that does not establish that claim 4 encompasses obvious subject matter. This argument was not, however, raised before the District Court. There Teleflex was content to assert only that the problem motivating the invention claimed by the Engelgau patent would not lead to the solution of combining of Asano with a sensor. See Teleflex's Response to KSR's Motion for Summary Judgment of Invalidity in No. 02–74586 (ED Mich.), pp. 18–20, App. 144a–146a. It is also unclear whether the current argument was raised

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before the Court of Appeals, where Teleflex advanced the nonspecific, conclusory contention that combining Asano with a sensor would not satisfy the limitations of claim 4. See Brief for Plaintiffs-Appellants in No. 04-1152 (CA Fed.), pp. 42-44. Teleflex's own expert declarations, moreover, do not support the point Teleflex now raises. See Declaration of Clark J. Radcliffe, Ph.D., Supplemental App. 204-207; Declaration of Timothy L. Andresen, *id.*, at 208-210. The only statement in either declaration that might bear on the argument is found in the Radcliffe declaration:

"Asano ... and Rixon ... are complex mechanical linkage-based devices that are expensive to produce and assemble and difficult to package. It is exactly these difficulties with prior art designs that [Engelgau] resolves. The use of an adjustable pedal with a single pivot reflecting pedal position combined with an electronic control mounted between the support and the adjustment assembly at that pivot was a simple, elegant, and novel combination of features in the Engelgau '565 patent." *Id.*, at 206, ¶ 16.

Read in the context of the declaration as a whole this is best interpreted to mean that Asano could not be used to solve "[t]he problem addressed by Engelgau '565[:] to provide a less expensive, more quickly assembled, and smaller package adjustable pedal assembly with electronic control." *Id.*, at 205, ¶ 10.

The District Court found that combining Asano with a pivot-mounted pedal position sensor fell within the scope of claim 4. 298 F.Supp.2d, at 592-593. Given the significance of that finding to the District Court's judgment, it is apparent that Teleflex would have made clearer challenges to it if it intended to preserve this claim. In light of Teleflex's failure to raise the argument in a clear fashion, and the silence of the Court of Appeals on the issue, we take the District Court's conclusion on the point to be correct.

B

[7] The District Court was correct to conclude that, as of the time Engelgau designed the subject matter in claim 4, it was obvious to a person of ordinary skill to combine Asano with a pivot-mounted pedal position sensor. There then existed a marketplace that created a strong incentive to convert mechanical pedals to electronic pedals, and the prior art taught a number of methods for achieving this advance. The Court of Appeals considered the issue too narrowly by, in effect, asking whether a pedal designer writing on a blank slate would have chosen both Asano and a

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modular sensor similar to the ones used in the Chevrolet truckline and disclosed in the '068 patent. The District Court employed this narrow inquiry as well, though it reached the correct result nevertheless. The proper question to have asked was whether a pedal designer of ordinary skill, facing the wide range of needs created by developments in the field of endeavor, would have seen a benefit to upgrading Asano with a sensor.

In automotive design, as in many other fields, the interaction of multiple components means that changing one component often requires the others to be modified as well. Technological developments made it clear that engines using computer-controlled throttles would become standard. As a result, designers might have decided to design new pedals from scratch; but they also would have had reason to make pre-existing pedals work with the new engines. Indeed, upgrading its own pre-existing model led KSR to design the pedal now accused of infringing the Engelgau patent.

For a designer starting with Asano, the question was where to attach the sensor. The consequent legal question, then, is whether a pedal designer of ordinary skill starting with Asano would have found it obvious to put the sensor on a fixed pivot point. The prior art discussed above leads us to the conclusion that attaching the sensor where both KSR and Engelgau put it would have been obvious to a person of ordinary skill.

The '936 patent taught the utility of putting the sensor on the pedal device, not in the engine. Smith, in turn, explained to put the sensor not on the pedal's footpad but instead on its support structure. And from

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the known wire-chafing problems of Rixon, and Smith's teaching that "the pedal assemblies must not precipitate any motion in the connecting wires," Smith, col. 1, lines 35–37, Supplemental App. 274, the designer would know to place the sensor on a nonmoving part of the pedal structure. The most obvious nonmoving point on the structure from which a sensor can easily detect the pedal's position is a pivot point. The designer, accordingly, would follow Smith in mounting the sensor on a pivot, thereby designing an adjustable electronic pedal covered by claim 4.

Just as it was possible to begin with the objective to upgrade Asano to work with a computer-controlled throttle, so too was it possible to take an adjustable electronic pedal like Rixon and seek an improvement that would avoid the wire-chafing problem. Following similar steps to those just explained, a designer would learn from Smith to avoid sensor movement and would come, thereby, to Asano because Asano disclosed an adjustable pedal with a fixed pivot.

Teleflex indirectly argues that the prior art taught away from attaching a sensor to Asano because Asano in its view is bulky, complex, and expensive. The only evidence Teleflex marshals in support of this argument, however, is the Radcliffe declaration, which merely indicates that Asano would not have solved Engelgau's goal of making a small, simple, and inexpensive pedal. What the declaration does not indicate is that Asano was somehow so flawed that there was no reason to upgrade it, or pedals like it, to be compatible with modern engines. Indeed, Teleflex's own declarations refute this conclusion. Dr. Radcliffe states that Rixon suffered from the same bulk and complexity as did Asano. See *id.*, at 206. Teleflex's other expert, however, explained that Rixon was itself designed by adding a sensor to a pre-existing mechanical pedal. See *id.*, at 209. If Rixon's base pedal was not too flawed to upgrade, then Dr. Radcliffe's declaration does not show Asano was either. Teleflex may have made a plausible argument that Asano is inefficient as compared to Engelgau's preferred embodiment, but to judge Asano against Engelgau would be to engage in the very hindsight bias Teleflex rightly urges must be avoided. Accordingly, Teleflex has not shown anything in the prior art that taught away from the use of Asano.

Like the District Court, finally, we conclude Teleflex has shown no secondary factors to dislodge the determination that claim 4 is obvious. Proper application of *Graham* and our other precedents to these facts therefore leads to the conclusion that claim 4 encompassed obvious subject matter. As a result, the claim fails to meet the requirement of § 103.

We need not reach the question whether the failure to disclose Asano during the prosecution of Engelgau voids the presumption of validity given to issued patents, for claim 4 is obvious despite the presumption. We nevertheless think it appropriate to note that the rationale underlying the presumption—that the PTO, in its expertise, has approved the claim—seems much diminished here.

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IV

[8] A separate ground the Court of Appeals gave for reversing the order for summary judgment was the existence of a dispute over an issue of material fact. We disagree with the Court of Appeals on this point as well. To the extent the court understood the *Graham* approach to exclude the possibility of summary judgment when an expert provides a conclusory affidavit addressing the question of obviousness, it misunderstood the role expert testimony plays in the analysis. In considering summary judgment on that question the district court can and should take into account expert testimony, which may resolve or keep open certain questions of fact. That is not the end of the issue, however. The ultimate judgment of obviousness is a legal determination. *Graham*, 383 U.S., at 17. Where, as here, the content of the prior art, the scope of the patent claim, and the level of ordinary skill in the art are not in material dispute, and the obviousness of the claim is apparent in light of these factors, summary judgment is appropriate. Nothing in the declarations proffered by Teleflex prevented the District Court from reaching the careful conclusions underlying its order for summary judgment in this case.

* * *

We build and create by bringing to the tangible and palpable reality around us new works based on instinct, simple logic, ordinary inferences, extraordinary ideas, and sometimes even genius. These advances, once part of our shared knowledge, define a new threshold from which innovation starts once more. And as progress beginning from higher levels of achievement is expected in the normal course, the results of ordinary innovation are not the subject of exclusive rights under the patent laws. Were it otherwise patents might stifle, rather than promote, the progress of useful arts. See U.S. Const., Art. I, § 8, cl. 8. These premises led to the bar on patents claiming obvious subject matter established in *Hotchkiss* and codified in § 103. Application of the bar must not be confined within a test or formulation too constrained to serve its purpose.

KSR provided convincing evidence that mounting a modular sensor on a fixed pivot point of the Asano pedal was a design step well within the grasp of a person of ordinary skill in the relevant art. Its arguments, and the record, demonstrate that claim 4 of the Engelgau patent is obvious. In rejecting the District Court's rulings, the Court of Appeals analyzed the issue in a narrow, rigid manner inconsistent with § 103 and our precedents. The judgment of the Court of Appeals is reversed, and the case remanded for further proceedings consistent with this opinion.

It is so ordered.

- End of Case -

Exhibit D

Source: USPQ, 2d Series (1986 - Present) > U.S. Court of Appeals, Federal Circuit > ATD Corp. v. Lydall Inc., 48 USPQ2d 1321 (Fed. Cir. 1998)

ATD Corp. v. Lydall Inc., 48 USPQ2d 1321 (Fed. Cir. 1998)

48 USPQ2d 1321

ATD Corp. v. Lydall Inc.

U.S. Court of Appeals Federal Circuit

Nos. 97-1308, -1356

Decided October 6, 1998

159 F3d 534

Headnotes

PATENTS

[1] Patent construction -- Claims -- Defining terms (► 125.1305)

Term "embossments," as used in claims of patents for thermal insulation pads, means depressions or bumps that separate and form gap between at least some of foil layers in pads by point contact of embossments with adjacent layers, since specifications show and claims require that insulating gap between at least some of metal foil layers in pad is formed by embossments that space apart foil layers, since presence of embossments making contact with adjacent layers of foil to separate layers is described in specifications as material aspect of invention, and since use of heat-resistant mesh or scrim between some layers, even without embossments, does not defeat requirement of even broadest claims that pad contain at least two layers of foil bearing embossments that separate those layers.

[2] Infringement -- Literal infringement (► 120.05)

Federal district court properly granted summary judgment that accused thermal insulation does not literally infringe asserted claims of patents in suit, since claims require that at least two foil layers in insulation pads have "embossments" that separate and form gap between layers by point contact, since this separation function is express limitation of claims, and since, in accused product and method, there is no contact between impressed relief pattern on foil layers, which are separated by metal mesh, and any adjacent layer.

[3] Infringement -- Doctrine of equivalents -- In general (► 120.0701)

Substantial evidence supports jury's verdict that accused thermal insulation does not infringe asserted claims of patents in suit under doctrine of equivalents, since defendant presented expert testimony that metal mesh in accused product, which performs same function of separating foil layers of insulation pad as "embossments" of claims, does so in substantially different way to produce substantially different result, and that use of mesh preserves sheet reflectivity and results in greater crush resistance, providing advantages as well as differences.

[4] Patentability/Validity -- Anticipation -- Identity of elements (► 115.0704)

None of cited prior art references anticipate asserted claims of patents for thermal insulation, since none of them show combination of embossed insulating layers and compressed heat sink layers required by claims.

[5] Patentability/Validity -- Obviousness -- Combining references (► 115.0905)

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Patentability/Validity -- Obviousness -- Secondary considerations generally (► 115.0907)

Patents for thermal insulation are not obvious over combination of prior art references cited by infringement defendant, even though "embossments" similar in general shape to those of patents have been used to space insulating layers of various forms, since some references cautioned against compressing layers in multilayer insulator, and none showed compressing layers to form heat sink as in patented product and method, since there is no evidence of teaching or suggestion to select components inventors selected, from crowded field of insulation technology, to produce product and method of patents, and since patented product met unsolved need and was quickly adopted by automotive industry.

[6] Practice and procedure in Patent and Trademark Office -- Prosecution -- Duty of candor -- Citation of references (► 110.0903.08)

Applicant did not engage in inequitable conduct by failing to cite prior art U.S. patent, or Patent Cooperation Treaty search report and prosecution records applying that patent to corresponding PCT application, in divisional application for patent in suit, since prior patent was cited in prosecution of parent application, and it is not inequitable conduct to fail to resubmit, in divisional application, information cited or submitted in parent, and since applicant was not required to resubmit documents relating to prior patent in record of PCT application when that patent was already of record in U.S. application; details of foreign prosecution are not additional category of material information.

JUDICIAL PRACTICE AND PROCEDURE

[7] Procedure -- New trial; JMOL (► 410.30)

Standard to be applied in determining whether admission of evidence in patent infringement

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action constituted harmless error is not whether there was "substantial evidence" of non-infringement without tainted evidence, since Fed.R.Civ.P. 61 defines harmless error as any error or defect in proceeding "which does not affect the substantial rights of parties"; admission of evidence is therefore reviewed for whether, under circumstances presented, it reasonably affected outcome of case.

[8] Procedure -- New trial; JMOL (► 410.30)

Admission of infringement defendant's patent as evidence that its products were substantially different from and superior to that covered by plaintiff's patents, under circumstances in which plaintiff was unable to present defense on substance of defendant's patent, does not warrant new trial, since, in view of correctly construed claims, reasonable jury could not have found either literal infringement or infringement under doctrine of equivalents, and admission of defendant's patent as evidence therefore did not affect outcome of case.

[9] Procedure -- Discovery -- In general (► 410.4001)

35 USC 282, which provides that party asserting invalidity of patent in suit must give notice of prior art relied upon as evidence of anticipation to adverse party at least 30 days before trial, does not override discovery schedule set under Federal Rules of Civil Procedure, since procedure set by court and agreed to by parties necessarily governs particular trial, and although Section 282 sets minimum period for identification of prior art to be introduced as evidence of anticipation, specific judicial directive for timing of discovery establishes procedures to which parties are bound.

Particular Patents

Particular patents -- General and mechanical -- Thermal insulation

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5,111,577, Sheridan and Ragland, pad including heat sink and thermal insulation areas, judgment of non-infringement *affirmed*; judgment of invalidity *reversed*.

Case History and Disposition

Page 1322

Appeal from the U.S. District court for the Eastern District of Michigan, Rosen, J.; 43 USPQ2d 1170 .

Action by ATD Corp. against Lydall Inc. for patent infringement. Plaintiff appeals from judgment holding certain claims of patents in suit invalid and not infringed, and defendant cross-appeals from holding that inequitable conduct was not established. Affirmed in part and *reversed* in part; Clevenger, J., concurring in part and dissenting in part in separate opinion.

Attorneys

Bruce T. Wieder, Frederick G. Michaud Jr., Eric H. Weisblatt, and Ronni Jillions, of Burns, Doane, Swecker & Mathis, Alexandria, Va., for plaintiff-appellant.

Barry L. Grossman, of Foley & Lardner, Washington, D.C.; William P. Atkins, of Pillsbury, Madison & Sutro, Washington, for defendant-cross appellant.

Judge

Before Rich, Newman, and Clevenger, circuit judges.

Opinion Text

Opinion By:

Newman, J.

ATD Corporation appeals the final judgment ¹ of the United States District Court for the Eastern District of Michigan, holding the claims in suit of United States Patents No. 5,011,743 (the '743 patent) and No. 5,111,577 (the '577 patent), both entitled "Pad Including Heat Sink and Thermal Insulation Areas," invalid and not infringed. We affirm the rulings of non-infringement and reverse the rulings of invalidity. On Lydall's cross-appeal we affirm that inequitable conduct was not established. The challenged evidentiary rulings are sustained.

¹ *ATD Corp. v. Lydall, Inc.* , 43 USPQ2d 1170 (E.D. Mich. 1997).

BACKGROUND

The '743 patent relates to a flexible insulating pad that includes heat sink and thermal insulation areas. It is described as particularly useful for providing "hot spot" insulation, and is used primarily in automotive underbodies. It achieved prompt commercial acceptance, as an economical and efficient structure for

dissipating heat. Two of the patent drawings are reproduced below. Fig. 1 a top view and Fig. 2 a cross section of the patented pad:

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The thermal insulation area 5 is made of layers of metal foil 2 separated by air gaps, and the heat sink area 4 is formed by compressing the edges of the foil layers. The depressions at 6 are called "embossments," and the dashed lines at 11 represent optional layers of heat-resistant scrim.

Claims 1 and 3 of the '743 patent are at issue, shown with emphases added to highlight the disputed subject matter with respect to infringement; all of the other claim elements and limitations are conceded to be present in the accused pads:

1. A pad including thermal insulation and heat sink areas comprising:

a plurality of layers of metal foil forming a stack wherein said layers are arranged one above another in a vertical direction,

said stack including at least one heat sink area and at least one thermal insulating area adjacent to said heat sink area,

said layers providing better heat condition in said vertical direction at said heat sink area than at said insulating area,

at least two of said layers including *a plurality of embossments therein separating said layers in said insulating area so as to provide gaps therebetween* ,

one of said layers in said insulating area being adjacent to and not metallurgically bonded to another one of said layers,

said heat sink area comprising a compressed portion of said stack.

3. The pad of claim 1, wherein said heat sink area at least partly surrounds said insulating area and said layers in said heat sink area are interengaged with each other by securing means.

The '577 patent is a division of the '743 patent, and relates to the manufacture of the pad. Claims 1, 11, and 19 of the '577 patent are as follows, with emphases added to show the usages of "embossments," the only point of dispute.

1. A method of making a heat insulating pad having insulating and heat sink areas, comprising:

a step of assembling a plurality of layers of metal foil in a stack wherein said layers are arranged one above another in a vertical direction, *at least two of said layers being separated from each other by a plurality of embossments* on at least one of said layers;

a step of compressing at least one portion of said stack such that heat sink and insulating areas are

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formed therein with said layers providing better heat conduction in said vertical direction at said heat sink area than at said insulating area, *said embossments in said insulating area separating said layers so as to provide a gap therebetween*; and

a step of securing said layers together in said heat sink area, said securing step including interengaging said layers in said heat sink area with each other.

11. A method of making a heat insulating pad having insulating and heat sink areas, comprising:

a step of assembling a plurality of layers of metal foil in a stack wherein said layers are arranged one above another in a vertical direction, *at least two of said layers being separated from each other by a plurality of embossments* on at least one of said layers; and

a step of compressing at least one portion of said stack such that heat sink and insulating areas are formed therein with said layers providing better heat conduction in said vertical direction at said heat sink area than at said insulating area, *said embossments in said insulating area separating said layers so as to provide a gap therebetween*.

19. The method of claim 11, wherein said assembling step comprises assembling a plurality of layers of metal foil which make said pad flexible.

The accused Lydall pads contain heat sink and insulating areas, in accordance with the claims, and are the same as the ATD pads except that the Lydall foil layers are separated by knitted or woven mesh instead of by depressions in the foil. ATD argues that due to compression forces applied during manufacture, the Lydall foil layers are "embossed" with the impressions of the intervening mesh. ATD states that these "embossments," along with the mesh reach to the adjacent layers of foil, and thus that the product and process claims are infringed, literally or in accordance with the doctrine of equivalents.

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Upon ATD's suit for patent infringement, Lydall raised the defenses of non-infringement, invalidity, and unenforceability. On cross-motions for summary judgment, the district court granted Lydall's motion that there was not literal infringement and no willful infringement. The district court also granted ATD's motion that there was not inequitable conduct in the prosecution of the patents. The court ruled that there were genuine issues of material fact on the issue of infringement under the doctrine of equivalents and the issue of validity; these issues were tried to a jury. The jury found that Lydall did not infringe, under the doctrine of equivalents, claim 3 of the '743 patent, nor claims 1, 5-7, 11, or 19 of the '577 patent. The jury deadlocked on the issue of infringement by equivalents of claim 1 of the '743 patent. The jury also found that claims 1 and 3 of the '743 patent and claims 1, 11, and 19 of the '577 were invalid based on prior art. The district court entered judgment accordingly, and denied all post-trial motions. Each side appeals the rulings adverse to it.

I

LITERAL INFRINGEMENT

Determination of the issue of literal infringement involves the steps of first construing the claims, a matter of law assigned to the judge whether or not a jury trial has been demanded, and then applying the construed claims to the accused device, a factual determination performed by the jury. See *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976, 34 USPQ2d 1321, 1326 (Fed.Cir. 1995) (in banc), aff'd, 517 U.S. 370, 38 USPQ2d 1461 (1996). In this case, as often occurs, the question of literal infringement was resolved upon the court's construction of the claims. See *id.* at 999, 34 USPQ2d at 1346 (Newman, J., dissenting) ("Deciding the meaning of the words used in the patent is often dispositive of the question of infringement.") Thus a court may grant summary judgment when, upon construction of the claims and

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with all reasonable factual inferences drawn in favor of the non-movant, it is apparent that only one conclusion as to infringement could be reached by a reasonable jury. See Fed.R.Civ.P. 56(c); *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 250 (1986) (purpose of summary judgment is to avoid an unnecessary trial); *Multiform Desiccants Inc. v. Medzam Ltd.*, 133 F.3d 1473, 1476, 45 USPQ2d 1429, 1431 (Fed.Cir. 1998) (affirming ruling that given correct claim construction no reasonable jury could find literal infringement). Claim construction is determined *de novo* on appeal, *Cybor Corp. v. FAS Technologies, Inc.*, 138 F.3d 1448, 1456, 46 USPQ2d 1169, 1174 (Fed.Cir. 1998) (in banc); *Markman*, 52 F.3d at 979, 34 USPQ2d at 1329, as is the correctness of the grant of summary judgment, *Cole v. Kimberly-Clark Corp.*, 102 F.3d 524, 532, 41 USPQ2d 1001, 1007 (Fed.Cir. 1996).

A. Claim Construction

The claims of both the '577 and '543 patents recite layers of metal foil having "a plurality of embossments" that separate the layers and establish gaps of insulating air between the layers. Lydall's position is that its foil layers are not "embossed"; ATD argues that they are, and that the district court erred in its construction of this term, leading to error in the ensuing decisions of non-infringement.

The district court drew on the two patent specifications for the meaning of "embossments" as used in the claims. See *Slimfold Mfg. Co. v. Kinkead Industries, Inc.*, 810 F.2d 1113, 1116, 1 USPQ2d 1563, 1566 (Fed.Cir. 1987) (claims are understood in light of the specification of which they are a part). When "the specification explains and defines a term used in the claims, without ambiguity or incompleteness, there is no need to search further for the meaning of the term." *Multiform*, 133 F.3d at 1478, 45 USPQ2d at 1433. However, when such definition is challenged it is often appropriate, despite facial clarity and sufficiency of the specification and the prosecution history, to receive evidence of the meaning and usage of terms of art from persons experienced in the field of the invention. See Fed.R. Evid. 702-706.

The specifications of both patents in suit define the embossments as "depressions" and "bumps or projections," the numbers referring to Fig. 2 *supra* :

The embossments 6 form depressions on one side of a respective one of the layers 2 and bumps or projections on an opposite side of the respective layer.

'743 patent, col. 7, lines 37-39; '577 patent, col. 7, lines 41-44. The district court observed that this definition is consistent with the dictionary definition of "emboss" as meaning to "raise in relief from a surface." ATD argues that this definition supports its position, since Lydall's foil layers have "bumps and indentations." ATD argues that there is no reason to believe that the inventor

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used the term differently from its dictionary meaning, leaving no ambiguity and thus no need for "claim construction." ATD states that the district court erred in law in construing "embossments" as also requiring that the bumps and indentations reach from layer to layer of the foil. Thus ATD argues that since the claims are not ambiguous, and since "embossments" has a clear meaning, it is incorrect to add to the definition of "embossments" the requirement that they also serve to separate the layers of metal foil by the depth of the embossments that contact the adjacent layer of foil.

The specifications teach that the embossments make point contact between the adjacent layers of foil:

The pad 1 can include two layers 2 only one of which includes the embossments 6. In a preferred embodiment, however, at least two of the layers adjacent to each other include a pattern of the embossments 6, the layers being offset with respect to each other such that at least some of the embossments are not aligned in the vertical direction. With this arrangement, the layers 2 can be provided in point contact to minimize heat transfer therebetween in the vertical direction A.

'743 patent, col. 7, lines 9-17; '577 patent, col. 7, lines 13-21. The district court also reviewed the patent drawings, and correctly described them as showing "the embossments as being raised reliefs on the

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various layers such that the embossments come in direct point contact with adjacent layers (Figures 2 and 5 of the '743 and '577 patents.)" The court concluded that "embossments" as used in the claims require raised reliefs that separate adjacent layers of foil by point contact.

ATD states that the district court erroneously incorporated into the definition of "embossments" in the claims in suit the structural feature of "point contact" from non-asserted claim 11 of the '743 patent, which reads:

11. The pad of claim 1, wherein said pad is flexible and at least some of said embossments form depressions on one side of a respective one of said layers and bumps on an opposite side of said respective layer, *said embossments providing point contact between the layers*.

(Emphasis added.) ATD argues that point contact is described in the specification as simply a preferred embodiment, and is not a limitation to the claims that do not include it. ATD states that a definition of embossments without point contact is also supported by the description in the '743 and '577 specifications of an embodiment wherein layers of a heat-resistant mesh or scrim are interposed between foil layers. ATD states that since claim 1 is generic to the various embodiments shown in the specification, it was an error of law to restrict the broadest claim to the embodiment illustrated in Fig. 2 wherein the embossments are in point contact with adjacent foil layers.

Lydall responds that the mere fact that non-asserted claim 11 specifically states that the embossments are in point contact does not preclude the construction of claim 1 as requiring that the embossments separate the layers. Lydall points out that for the embodiment in which ATD uses mesh between some foil layers, the specification shows that at least some of the layers are separated by point contact of the embossments. Non-asserted dependent claim 14 of the '743 patent, which specifies one or more layers of scrim, also incorporates the claim 1 limitation of at least two "layers including a plurality of embossments therein separating said layers in said insulating area so as to provide gaps therebetween."

The separation of layers and ensuing provision of insulating gaps arise from the point contact. Thus we agree that the correct interpretation of the claims in suit is that, whether or not mesh is used between some of the foil layers, the embossments serve to separate at least some of the layers. The doctrine of claim differentiation can not broaden claims beyond the scope that is supported by the specification. *Multiform Desiccants*, 133 F.3d at 1480, 45 USPQ2d at 1434 ("claim differentiation can not broaden claims beyond their correct scope"); *Tandon Corp. v. United States Int'l Trade Comm'n*, 831 F.2d 1017, 1023, 4 USPQ2d 1283, 1288 (Fed. Cir. 1987) ("Whether or not claims differ from each other, one can not interpret a claim to be broader than what is contained in the specification and claims as filed.") The presumption that separate claims have different scope "is a guide, not a rigid rule." *Autogiro Co. of America v. United States*, 384 F.2d 391, 404, 155 USPQ 697, 708 (Ct.Cl. 1967).

ATD also argues that the district court improperly added a method limitation to the product claims when it interpreted the method claims as requiring the embossments to be made on the metal sheets before the assembly process. The district court held that "[t]he specifications make clear that the 'embossments' as contemplated under the patents are made on the metal sheets *prior to any assembly process*" (district court's emphasis), and that "the '577 patent is very clear on pre-assembly embossment." The

court cited the specification of the '577 patent:

The method according to the invention can also include a step of embossing a plurality of the layers 2 such that a plurality of the embossments 6 are formed therein, the embossing step being performed by simultaneously embossing a plurality of overlapping sheets 2 of the metal foil, *each of the sheets after the embossing step comprising a respective one of the layers*. The embossments can be provided in a random or uniform repeated pattern. It is also within the scope of the invention to emboss each sheet separately. *The embossments can be provided by passing a single sheet or stack of sheets between a pair of rollers having the desired embossment pattern thereon*.

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'577 patent, col. 8, lines 32-44 (district court's emphasis).

This aspect is relevant to both the product and the method claims, for it was not disputed that in the Lydall pad a pattern of impressions is produced on the metal foil after the foil is assembled into layers, by compression of the foil against the intervening mesh. The specifications make clear that the "embossments" of the '743 and '577 patents are "something more than 'impressions' on the surface of the foil layers which are merely 'incidental,' " in the district court's words. The claims require that the "embossments" be deep enough to separate the adjacent layers of foil; the product claims are not dependent on how the embossments are made, and were not construed otherwise.

[1] Upon plenary review we confirm the district court's claim construction. The '743 and '577 specifications show and the claims require that the insulating gap between at least some of the metal foil layers is formed by the embossments that space apart the foil layers. In the patent specifications the presence of embossments making contact with adjacent layers of foil to separate the layers is described as a material aspect of the invention. The use of a mesh or scrim between some of the layers, even without "embossments" in those layers, does not defeat the requirement of even the broadest claims that the pad contain at least two layers of foil bearing embossments that separate the layers. Claim 1 of the '743 patent, correctly interpreted, embraces generically the use of mesh between some of the foil layers, but also requires that embossments on some of the foil layers make contact with and separate adjacent foil layers. All of the claims of both patents require embossments that serve this function, and the specifications make clear that this is essential to the patented invention. We conclude, as did the district court, that "embossments" as used in the '743 and '577 patents means depressions or bumps that separate and form a gap between at least some of the foil layers by point contact of the embossments with adjacent layers. This definition applies to all the claims in suit.

B. Application to Accused Devices

We give plenary review to the district court's grant of Lydall's motion for summary judgment of non-infringement, reapplying the standard for summary adjudication as applied by the district court.

Lydall's original product (discontinued after June 1, 1995) included an outer layer of metal foil with a "decorative pattern" in relief. The ensuing product did not include this outer pattern in relief. The court found that these indentations "projected outward, only -- i.e., they did not provide point contact with adjacent interior solid metal layers, nor did they provide gaps between the layers." The court held that although these outer layers were "embossed" in the ordinary usage of the word, they did not contain "embossments" within the meaning of that term in the patents. We agree that no reasonable jury could have found otherwise.

In the Lydall product the metal foil layers are each separated by an intervening layer of metal mesh. When the mesh is pressed between the foil layers during the assembly process, there is created a patterned impression of the mesh on the smooth metal foil sheets. Applying the claims as construed, the district court found that these impressions do not constitute "embossments" as that term is used in the ATD claims, and that the Lydall impressions are "merely incidental to the contact of the mesh with the surface of the metal layers." The district court found that in the Lydall product it is the mesh that separates the layers and creates the insulating gap, and not the embossed depressions that are formed in the metal foil where it is pressed against the mesh. The court found that there was no point contact between the Lydall layers, as required by the court's claim construction, for "[t]he metal mesh in fact prevents all contact between the adjacent metal sheet layers." The court concluded that because there were no embossments providing point contact, summary judgment of no literal infringement was appropriate because an essential limitation of the claims was absent from the accused structure and method.

ATD argues that the Lydall embossments literally meet the claims' requirement of embossments, not only in the plain meaning of "emboss," but also because the Lydall embossments contribute along with the mesh to the gaps between the foil layers. ATD stresses that point contact is not a limitation to the claims in suit, and that the presence of the wire mesh between the foil layers of the Lydall product does not avoid literal infringement because there are embossments on the Lydall foil layers. ATD also argues that the issue of whether the Lydall embossments contribute to the gap between the layers of foil presents a question of material fact that could not be summarily resolved against ATD, and requests trial of this question.

[2] It is not disputed that in the Lydall product and method there is no contact between the impressed relief pattern on the foil layers, and any adjacent layer. There are no "embossments," as we and the district court construe the term as used in the patents, to separate the foil layers. This separation function is an express limitation of the asserted claims. In view of its absence from the accused product and method, no reasonable jury could have found that the asserted claims are literally infringed by the Lydall product or method. See *Cole*, 102 F.3d at 532, 41 USPQ2d at 1007 (affirming summary ruling of non-infringement when "accused products do not literally meet all of the claim limitations"). Therefore, summary judgment of no literal infringement was properly granted.

II

INFRINGEMENT BY EQUIVALENTS

The question of infringement in terms of the doctrine of equivalents was given to the jury. The district court construed the term "embossments," in Jury Instruction No. 25, as follows:

25. . . . You are instructed that embossments are purposefully created patterns directly formed on individual foil layers that produced depressions on one side of a respective layer and bumps or projections on the opposite side of the respective layer. The embossments create projections providing direct point contact with adjacent layers. The embossments must be large enough to separate the layers and provide gaps between the layers.

ATD argues that the district court incorrectly construed the claims, thereby distorting the jury's finding of non-infringement and providing an incorrect basis for the jury verdict. See *United States Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568, 41 USPQ2d 1225, 1236 (Fed.Cir. 1997) (reviewing whether jury verdict was in accordance with correct claim construction). As we have discussed, the district court's construction of the term "embossments" correctly included the requirement of point contact.

[3] On the issue of equivalency the jury was instructed as follows:

27. . . . Under the doctrine of equivalents, you must find that there are insubstantial differences between the patent claims and the alleged infringing product or method of making the product. In this regard, you may consider whether the defendant's product or method performs (1) substantially the same function (2) in substantially the same way (3) to produce substantially the same result when compared to the plaintiff's patented product or method, even though they may differ in name, shape or form.

An accused product or method does not infringe under the doctrine of equivalents if it performs the function and achieves the result in a substantially different way than the claimed invention.

The doctrine of equivalents does not involve the application of a formula and is not an absolute to be considered in a vacuum. Rather, the question of whether one component of the allegedly infringing product or method is equivalent to an element in the patented claim is a factual matter. It requires you to consider the context of the entire claim. Your answer will depend upon the drawings and written description, the patent application history, the prior art and all the circumstances of this case.

Other factors to be considered in determining infringement is the known interchangeability of the accused and claimed elements or other objective technological evidence demonstrating that the substitute nevertheless represents a change that one of ordinary skill in the art would have considered "insubstantial" at the time of infringement. Evidence of copying and evidence of "designing around" are also relevant to the question of infringement under the doctrine of equivalents.

The issue of infringement under the doctrine of equivalents was fully litigated. One of Lydall's expert witnesses testified that the Lydall mesh is substantially different from the ATD embossments. He testified that

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although the Lydall mesh and the ATD embossments perform the function of separating the foil layers, they do so in substantially different ways, leading to substantially different results. According to Lydall's expert, the use of the Lydall mesh preserves sheet reflectivity and results in greater crush resistance, providing advantages as well as differences. ATD disputed this evidence and its significance, and stressed that Lydall used the combination of a heat sink and insulator, the most important part of the ATD invention. Reviewing the record, we conclude that there is substantial evidence to support the jury verdict that there is not infringement under the doctrine of equivalents.² That judgment is *affirmed*.

² The concurring/dissenting opinion draws analogy to a case styled *Vehicular Technologies*. However, the cases are not the same. In the case at bar the function of the embossments separating the layers is stated in the claims, whereas in *Vehicular* the function of back-up is stated only in the descriptive text of the specification.

III

PATENT VALIDITY

The jury verdict was that claims 1 and 3 of the '743 patent and claims 1, 11, and 19 of the '577 patent were invalid based on prior art. The district court entered judgment accordingly.³ The evidence is reviewed to ascertain whether the jury's express or implicit factual findings were supported by substantial evidence, and whether the legal conclusion represented by the verdict was adequately based on supported findings, accompanied by correct application of the law to the facts. See *Shatterproof Glass Corp. v. Libbey-Owens Ford Co.*, 758 F.2d 613, 619, 225 USPQ 634, 636 (Fed.Cir. 1985) ("In reviewing a decision denying a motion for judgment notwithstanding the verdict, we do not approach the issues as if there had been no trial. We review the evidence as a whole, and ascertain whether the verdict is in accordance with law, and whether there was substantial evidence in support of the jury's verdict.") In so doing, we resolve any disputed facts and draw all reasonable factual inferences in favor of the jury verdict. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1235, 9 USPQ2d 1913, 1919 (Fed.Cir. 1989); *DMI, Inc. v. Deere & Co.*, 802 F.2d 421, 425, 231 USPQ 276, 278-79 (Fed.Cir. 1986).

³ Although we have *affirmed* the judgment of non-infringement we review the merits of the judgment of invalidity, in accordance with *Cardinal Chem. Co. v. Morton Int'l, Inc.*, 508 U.S. 83, 98, 26 USPQ2d 1721, 1728 (1993).

Although the verdict form did not state the ground on which the jury relied, Lydall had raised grounds of both anticipation and obviousness, and the parties have argued both of these grounds on appeal.

Anticipation

A patent is invalid for anticipation when the same device or method, having all of the elements and limitations contained in the claims, is described in a single prior art reference. *Richardson*, 868 F.2d at 1236, 9 USPQ2d at 1920; *Perkin-Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 894, 221 USPQ 669, 673 (Fed.Cir. 1984). An anticipating reference must describe the patented subject matter with sufficient clarity and detail to establish that the subject matter existed and that its existence was recognized by persons of ordinary skill in the field of the invention. See *In re Spada*, 911 F.2d 705, 708, 15 USPQ2d 1655, 1657 (Fed.Cir. 1990); *Diversitech Corp. v. Century Steps, Inc.*, 850 F.2d 1566, 1567, 7 USPQ2d 1315, 1317 (Fed.Cir. 1988). Lydall relied on seven references, as follows:

The Collier U.K. Patent No. 126,780, entitled *Improvements in or connected with the Construction of Boxes or Cases or like objects and of the Floors, Roofs, Walls, Partitions or other Parts of Railway or other Vehicles or like objects*, was cited in the prosecution of the '743 patent. Collier, discussing insulation of railway cars, shows the use of embossed projections to separate metal layers for insulation, but does not describe foil layers and heat sink areas, as required by each of the claims.

The Meckenstock German utility model shows a heat shield for gas-exhausting parts of motor vehicles. Meckenstock describes the use of two sheet metal plates, at least one of them including projections to separate the plates, but shows no foil layers as required by each of the claims.

The ASTM (American Society for Testing Materials) Pub. C 667-80, entitled *Standard Recommended Practice for Prefabricated Reflective Insulation Systems for Equipment and Pipe Operating at Temperatures Above Ambient Air*, describes a rigid inner and outer case protecting embossed liners, which may be foil. The reference does not show compressed foil to form heat sink areas, as required by each of the claims, and cautions against such deformation of the liners.

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The ASTM Pub. C 740-82 entitled *Standard Practice for Evacuated Reflective Insulation in Cryogenic Service*, describes an insulator made from multiple layers of metal foil, the foil layers having embossments that separate the layers and form air gaps between the layers. This reference does not show compressing the layers to form heat sinks, and cautions against compression of the layers. Neither of the two ASTM references shows compressed layers of foil creating heat sink areas accompanying the insulating areas.

The article by F.E. Swalley et al., entitled *Practical Problems in Design of High-Performance Multilayer Insulation System for Cryogenic Stages*, Advances in Cryogenic Engineering, Vol. 10 at 208 (1965), describes a multilayer insulation system for cryogenic stages, again showing projections to space the layers apart, but does not show compressed layers of foil creating heat sink areas.

The article by L.D. Stimpson et al., entitled *Predicting Spacecraft Multilayer Insulation Performance from Heat Transfer Measurements*, Heat Transmission Measurements in Thermal Insulations, ASTM STP 544 (1974), is directed to multilayer insulation blankets in spacecraft. It describes multilayered insulation as "a series of radiation shields with low-conductivity spacers." Lydall does not discuss the substance of the Stimpson article in its brief, and we agree with ATD that Stimpson does not disclose an insulating area together with a heat sink area.

Logan et al. U.S. Patent No. 4,489,852 describes a cooking utensil, such as a cookie sheet, "of a double walled construction providing an insulating layer or volume of air therebetween," but does not show a stack of foil layers as called for by the claims. The parties stipulated that Logan et al. "do not disclose

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every element of the claims of the ATD patents arranged as in the claims."

[4] None of these references meets the criteria of anticipation, for none show the combination of embossed insulating layers and compressed heat sink areas. There was not substantial evidence to support a verdict of invalidity based on anticipation.

Obviousness

Obviousness is a legal conclusion based on underlying facts of four general types, all of which must be considered by the trier of fact: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; (3) the differences between the claimed invention and the prior art; and (4) any objective indicia of nonobviousness. See *Graham v. John Deere Co.*, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966); *Continental Can Co. USA, Inc. v. Monsanto Co.*, 948 F.2d 1264, 1270, 20 USPQ2d 1746, 1750 (Fed.Cir. 1991); *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1566-68, 1 USPQ2d 1593, 1595-97 (Fed.Cir. 1987).

Determination of obviousness can not be based on the hindsight combination of components selectively culled from the prior art to fit the parameters of the patented invention. There must be a teaching or suggestion within the prior art, or within the general knowledge of a person of ordinary skill in the field of the invention, to look to particular sources of information, to select particular elements, and to combine them in the way they were combined by the inventor. See *Heidelberger Druckmaschinen AG v. Hantscho Commercial Prods., Inc.*, 21 F.3d 1068, 1072, 30 USPQ2d 1377, 1379 (Fed.Cir. 1994) ("When the patented invention is made by combining known components to achieve a new system, the prior art must provide a suggestion or motivation to make such a combination."); *Northern Telecom, Inc. v. Datapoint Corp.*, 908 F.2d 931, 935, 15 USPQ2d 1321, 1324 (Fed.Cir. 1990) (the prior art must suggest to one of ordinary skill in the art the desirability of the claimed composition); *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1143, 227 USPQ 543, 551 (Fed.Cir. 1985).

ATD argues that there was not substantial evidence to support a finding that the prior art contained a teaching or suggestion to combine selected portions of the prior art in order to create the patented structure or method. ATD argues that the jury must have improperly reasoned with the hindsight of ATD's successful accomplishment. Lydall relied on the same group of references as for anticipation. However, Lydall points to no evidence supporting the obviousness determination, other than the conclusory opinion of its expert witness.

[5] We observe that embossments, similar in general shape to those of the ATD patents, have been used to space insulating layers of various forms. However, some of the cited references cautioned against compressing the layers in a multilayer insulator, and none showed compressing the insulating layers to form a heat sink as in the patented device and method. Lydall does not direct us to any evidence of a teaching or suggestion to select the components that ATD's inventors selected, from the crowded field of insulation technology, to produce the product and method of the '743 and '577 patents. Lydall's witnesses

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themselves expressed the view that such compression would be undesirable, providing cogent evidence that one of ordinary skill would not have deemed it obvious to compress the layers of an insulating device for heat sink purposes. Absent substantial evidence of such teaching or suggestion in the prior art or in the general knowledge of persons of ordinary skill in the field, there was not substantial evidence to support the jury's verdict of obviousness. It was undisputed that the product met an unsolved need and was quickly adopted by the automotive industry, this commercial success also weighing against obviousness.

Because there was not substantial evidence supporting the verdict on the ground of either anticipation or obviousness, the judgment of invalidity is *reversed*.

IV

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INEQUITABLE CONDUCT

Determination that a patent applicant engaged in inequitable conduct before the Patent and Trademark Office requires, as threshold findings of fact, both that the applicant failed to disclose material information to the PTO, and that he intended thereby to mislead or deceive the patent examiner into granting the patent. Materiality of the non-disclosed information, and culpable intent, must be established by clear and convincing evidence. When these facts are established, the court will weigh the findings and their premises and decide, in the court's exercise of discretion, whether to hold the patent unenforceable. *Kingsdown Medical Consultants, Ltd. v. Hollister Inc.*, 863 F.2d 867, 872, 9 USPQ2d 1384, 1389 (Fed.Cir. 1988) (in banc). We review the district court's ruling on the ultimate issue of inequitable conduct on the standard of abuse of discretion, *Kingsdown*, 863 F.2d at 876, 9 USPQ2d at 1392, while review of the underlying facts is on the clearly erroneous standard, with due consideration of the burden to establish both materiality and intent to deceive by clear and convincing evidence.

The district court ruled on summary judgment that the '743 and '577 patents were not unenforceable for inequitable conduct. Lydall appeals this ruling, stating that there were disputed facts as to whether certain information was material to patentability, and therefore that the issue was not amenable to summary disposition. Although the premises of inequitable conduct require findings based on all the evidence, a procedure that may preclude summary determination, see *KangaROOS U.S.A., Inc. v. Caldor, Inc.*, 778 F.2d 1571, 1577, 228 USPQ 32, 35 (Fed.Cir. 1985), a motion for summary judgment may be granted when, drawing all reasonable factual inferences in favor of the non-movant, the evidence is such that the non-movant can not prevail.

Lydall argued that during prosecution of the '577 divisional application ATD withheld U.S. Patent No. 2,212,481 to Sendzimir, as well as a PCT search report and prosecution records applying Sendzimir to the corresponding PCT application. Lydall argues that this inequitable conduct in prosecuting the '577 patent "infects" the '743 parent patent, and that both patents should be held unenforceable.

[6] The Sendzimir patent was cited in the prosecution of the '743 patent. Thus the district court found that ATD's failure to provide the Sendzimir information during the prosecution of the '577 divisional patent was not clear and convincing evidence of intent to deceive, observing that in accordance with M.P.E.P. Section 609 (Rev. 14, Nov. 1992)⁴ a reference is not required to be resubmitted in prosecuting a divisional application:

⁴ Further elaboration of the rule was subsequently made. See M.P.E.P. Section 609 (Rev. 3, July 1997).

Section 609. . . . the patent examiner will consider information cited or submitted to the Office in a parent application when examining a continuing application, and a list of the information need not be submitted in the continuing application unless applicant desires the information to be printed on the patent.

In view of Section 609 it can not be inequitable conduct for an applicant not to resubmit, in the divisional application, the information that was cited or submitted in the parent application. See *Transmatic, Inc. v. Gulton Industries, Inc.*, 849 F.Supp. 526, 31 USPQ2d 1225 (E.D. Mich. 1994), *aff'd in pertinent part*, *rev'd in part*, 53 F.3d 1270, 35 USPQ2d 1035 (Fed.Cir. 1995) (a material reference that is already of record in parent application need not be resubmitted by the applicant in a continuing application). Nor was ATD required to submit the documents relating to Sendzimir in the record of the PCT application, when Sendzimir was already of record in the United States parent application. Although international search reports may contain information material to patentability if they contain closer prior art than that which was before the United States

examiner, it is the reference itself, not the information generated in prosecuting foreign counterparts, that is material to prosecution in the United States. The details of foreign prosecution are not an additional category of material information. *See Molins PLC v. Textron, Inc.* , 48 F.3d 1172, 1180, 33 USPQ2d 1823, 1828 (Fed.Cir. 1995) (duty to cite material references arising in related foreign applications).

We discern no clear error in the district court's ruling that because the Sendzimir reference was of record in the parent '743 application, and because M.P.E.P. Section 609 states that the information need not be resubmitted, there was not clear and convincing evidence of material withholding with intent to deceive. The summary judgment of no inequitable conduct is *affirmed*.

V

EVIDENTIARY RULINGS

Evidentiary rulings, when appealable, are reviewed under the criteria of the regional circuit, unless the evidentiary issue is unique to patent law or litigation and thus would benefit from national uniformity. *See National Presto v. West Bend Co.* , 76 F.3d 1185, 1188 n.2, 37 USPQ2d 1685, 1686 n.2 (Fed.Cir. 1996) ("On procedural matters not unique to the areas that are exclusively assigned to the Federal Circuit, the law of the regional circuit shall be applied."

The abuse of discretion standard is applied to review of evidentiary rulings in the Sixth Circuit, as it is generally in the federal system. *E.g. , Schrand v. Federal Pacific Elec. Co.* , 851 F.2d 152, 156-57 (6th Cir. 1988) ("This court applies an abuse of discretion standard in reviewing decisions of a trial court on the admission of evidence.") In addition, Fed.R.Civ.P. 61 provides, "No error in either the admission or the exclusion of evidence . . . is ground for granting a new trial or for setting aside a verdict . . . unless refusal to take such action appears to the court inconsistent with substantial justice." *See Schrand* , 851 F.2d at 156-57. Thus evidentiary decisions are reviewed for abuse of discretion, and may be *reversed* only when that abuse has led to harmful error or the denial of substantial justice. *Cooley v. Carmike Cinemas, Inc.* , 25 F.3d 1325 (6th Cir. 1994).

A

ATD asserts that the district court abused its discretion in allowing Lydall to present Lydall's U.S. Patent No. 5,424,139 ("the Lydall patent") as evidence that its products were substantially different from and superior to that covered by ATD's patents, and that substantial justice requires a new trial. ATD states that Lydall, by its tactics, denied ATD adequate time to respond to this evidence.

During discovery, for each of the 19 claims of the Lydall patent ATD submitted a request for admission, asking Lydall to admit that "each accused Lydall shield is made in accordance with" that claim of the Lydall patent. Lydall's response, for each claim, was "Denied." Lydall retained that position for five months after the close of discovery. Twenty-nine days before the start of trial, Lydall changed its responses to "Denied, except as to shields made with twisted expanded metal mesh." Based on this tardy change in position ATD moved in limine to exclude evidence of the Lydall patent. The motion was denied on the first day of trial, the district court stating that Fed.R.Civ.P. 36 binds a party to an admission, but not to a denial.

Lydall presented its patent as showing that its products were deemed patentable by the Patent Office, despite citation of the ATD patents, and for the comparative data in the Lydall patent which showed superiority of the accused products over the ATD product. Lydall presented five witnesses on these issues, giving substance to ATD's complaint about the tactics of the deliberately tardy identification of this issue. ATD states that by this tactic it was denied reasonable time to investigate the patent and its data, depose Lydall's witnesses, and present contrary evidence. ATD states that it was surprised, ambushed, and severely prejudiced. *See Erskine v. Consolidated Rail Corp.* , 814 F.2d 266, 272 (6th Cir. 1987)

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("One of the primary objectives of the discovery provisions embodied in the Federal Rules of Civil Procedure is elimination of surprise in civil trials.")

Lydall responds that the fact of separate patentability is admissible evidence, and thus that the district court acted within its discretion in admitting it. As for the tardiness of the discovery response, Lydall states that it properly denied ATD's requests for admission five months earlier because "each' accused product was not so made." Lydall states that it amended its answers consistent with Fed.R.Civ.P. 26(e).

ATD states that all of the accused Lydall products are within the Lydall patent claims, but for a few prototypes. Lydall does not dispute this point. Nor does Lydall cite a change in circumstance justifying the

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change in its interrogatory responses. Fed.R.Civ.P. 36 requires that " [a] denial shall fairly meet the substance of the requested admission, and when good faith requires that a party qualify an answer or deny only part of the matter . . . , the party shall specify so much of it as is true and qualify or deny the remainder." At the trial Lydall presented five witnesses on various aspects of its patent, its prosecution, and its comparisons with the ATD product. It is not reasonable to assume that Lydall planned this trial presentation within the twenty-nine days after it gave notice to ATD that it would rely on the patent. By no stretch of the Rules can Lydall or its counsel be deemed to have met reasonable standards of fairness, good faith, or professionalism.

[7] The district court, in its opinion denying ATD's request for a new trial, stated that even if there were error in admitting the evidence, it was harmless because there was substantial evidence supporting a verdict of non-infringement even without the evidence of the Lydall patent:

Even if Lydall's patent were erroneously admitted, such an error was harmless. An error in the admission of evidence is not a ground for granting a new trial where the admission of the evidence was harmless error. Fed.R.Civ.P. 61. In this case, Lydall presented substantial evidence at trial of its effort to design around ATD's patents and also presented substantial evidence which showed that Lydall's metal mesh separated layers in a different manner than ATD's embossments. This evidence would support a non-infringement verdict even without evidence of Lydall's '139 patent.

That is not the correct standard. The question is not whether there was "substantial evidence" of non-infringement without the tainted evidence. See 11 Charles Alan Wright & Arthur R. Miller, *Federal Practice & Procedure* Section 2806 at 65 (1984 & Supp. 1998) (" [O]n a motion for a new trial . . . the judge may set aside the verdict even though there is substantial evidence to support it.") The question is whether the admission of the Lydall patent affected the substantial rights of ATD, see Fed.R.Civ.P. 61; Fed.R. Evid. 103, or was indeed harmless error. See *Schrand* , 851 F.2d at 157. Rule 61 provides:

Harmless Error. No error in either the admission or the exclusion of evidence . . . is ground for granting a new trial or for setting aside a verdict . . . unless refusal to take such action appears to the court inconsistent with substantial justice. The court . . . must disregard any error or defect in the proceeding which does not affect the substantial rights of parties.

See also Fed.R.Civ.P. 59; 11 Wright & Miller, *supra* Section 2805 at 60 ("The importance of Rule 61 in its application to motions for a new trial cannot be overlooked. . . . [I]t is only those errors that have caused substantial harm to the losing party that justify a new trial. Those errors that are not prejudicial do not call for relief under Rule 59.") Therefore, we review whether the admission of this evidence, under the circumstances of the tardy discovery response, reasonably affected the outcome of the case. See *Schrand* , 851 F.2d at 157 (citing Fed.R.Civ.P. 61 and quoting *Jordan v. Medley* , 711 F.2d 211 (D.C. Cir. 1983) (Scalia, J.) ("assessment of the likelihood that the error affected the outcome of the case")); 1 Jack B. Weinstein & Margaret A. Berger, *Federal Evidence* Section 103.41 [2] (1998) ("In general terms, the test of whether a substantial right of a party has been affected is whether the error in question affected the outcome of the case.")

Circuit Courts in civil cases not involving constitutional error have articulated the standard in different ways, e.g., whether it is "highly probable" that the erroneous admission did not affect the jury verdict, 1 Weinstein & Berger, *supra* Section 103.41 [2] at 103-53 n.32 (citing First, Third, and Eleventh Circuit cases); and whether it is "more probable than not" that the erroneous admission did not affect the jury verdict, 1 Weinstein & Berger, *supra* Section 103.41 [2] at 103-53 n.33 (citing Seventh, Eighth, Ninth, and Tenth Circuit cases). See also 3 James Wm. Moore, *Federal Practice Section 61.02 [3]* (1998) (standard of Rule 61 articulated in different ways). A number of factors have guided the courts in their determinations of whether error is harmless, including (1) whether erroneously admitted evidence was the primary evidence relied upon, (2) whether the aggrieved party was nonetheless able to present the substance of its claim, (3) the existence and usefulness of curative jury instructions, (4) the extent of jury argument based on tainted evidence, (5) whether erroneously admitted evidence was merely cumulative, and (6) whether other evidence was overwhelming. See 1 Weinstein & Berger, *supra* Section 103.41[5][a]- [h]; see also 11 Wright & Miller, *supra* Section 2885 [Rule 61] at 464 ("erroneous admission of evidence may be found not to have been prejudicial if the fact already had been shown by admissible evidence, or prejudice may be avoided by a curative instruction").

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The district court noted that it gave a limiting instruction to the jury concerning the Lydall patent:

23. Where there is an issued patent, the later issuance of a patent for a device or method raises no presumption of noninfringement of the previously issued patent. You may consider the later issued Lydall patent in your decision and give it the appropriate weight, but you must keep in mind that even where improvements and modifications are separately patentable, the improved device or method may still infringe the previously issued ATD patents.

A later patented device or method may include additional elements or steps beyond those claimed in the earlier issued patent. But if the later patented device or method contains each and every element of a claim of the earlier issued patent, or an equivalent of any element not literally included, then that claim of the earlier issued patent is infringed.

This instruction, however, did not relate to ATD's asserted inability to present a defense on the substance of the Lydall patent.

[8] Following a careful review of the trial record, we do not grant ATD's request for a new trial. Considering ATD's emphasis on the use of embossed foil layers to separate the layers, and the use of metal scrim in both the prior art and between one or two of the ATD outer layers in addition to the embossments, we are convinced that in view of the correctly construed claims, a reasonable jury could not have found either literal infringement or infringement under the doctrine of equivalents. On this basis the admission of the Lydall patent did not affect the outcome of this case.

B

Lydall cross-appeals the district court's refusal to allow Lydall to present U.S. Patent No. 2,037,813 (the Munters patent) as evidence of invalidity of ATD's patents. The court excluded the Munters patent because Lydall did not produce the reference during the designated discovery period.

According to the record, on December 20, 1994 ATD asked Lydall to identify each document Lydall considered to relate to validity and invalidity of the ATD patents. Lydall did not list the Munters patent in its reply of January 20, 1995. Subsequently, ATD served additional interrogatories and document requests, asking Lydall to identify prior art of which it was aware. Lydall did not list the Munters patent in any response. Following an extension, discovery closed on August 31, 1995. On December 1, 1995, Lydall served ATD with a "Notice of Prior Art Pursuant to 35 U.S.C. Section 282" listing the Munters patent. This was one month before a first rescheduled pretrial conference. Rejecting the submission, the

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court explained:

I want the record to be clear as to the basis that I am denying Lydall the opportunity to use that prior art at trial. The basis is not relevance. The basis is not any evidentiary ruling as to the value of this prior art. The basis is simply I'm exercising my discretion under the rule of the Federal Rules of Civil Procedure to preclude a party from relying on theories not made available or not disclosed to the opposing side.

Lydall states that although the Munters patent was not disclosed in response to any of the discovery requests or during the discovery period, it should not have been excluded because it was disclosed in accordance with 35 U.S.C. Section 282:

Section 282. . . . In actions involving the validity or infringement of a patent, the party asserting invalidity or noninfringement shall give notice in the pleadings or otherwise in writing to the adverse party at least thirty days before the trial, of the country, number, date, and name of the patentee of any patent, the title, date, and page numbers of any publication to be relied upon as anticipation of the patent in suit In the absence of such notice proof of said matters may not be made at the trial except on such terms as the court requires. . . .

Lydall argues that Section 282 overrides any discovery schedule set under the Federal Rules of Civil Procedure, because these Rules were instituted in 1938 whereas Section 282 was reenacted as part of the 1952 Patent Act. P.J. Federico, commenting on the 1952 Patent Act, reported the relationship in broad, and ambiguous terms:

The last paragraph of section 282 relating to the giving of notice of various details relating to certain defenses is based on part of the last paragraph of old R.S. 4920, with modifications. The old provision was in fact *superseded by* the Federal Rules of Civil Procedure [28 U.S.C.A.] but, as *modified*, has been reinstated.

[9] P.J. Federico, *Commentary on the New Patent Act* (1954), reprinted in 75 J. Pat. Trademark Off. Soc'y 161, 216 (1993). Since 1952, the matter has not been squarely resolved. In *Thermo King Corp. v. White's Trucking Serv., Inc.*, 292 F.2d 668, 674, 130 USPQ 90, 94 (5th Cir. 1961), that court

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referred to Section 282 as "coexisting" with the Federal Rules. We agree that they coexist. However, when the court has set and the parties have agreed to a discovery period, that procedure necessarily governs that trial. Thus although Section 282 sets a minimum period for the identification of prior art to be introduced as evidence of anticipation, a specific judicial directive for the timing of discovery establishes the procedures to which the parties are bound.

In *Eaton Corp. v. Appliance Valves Corp.*, 790 F.2d 874, 229 USPQ 668 (Fed.Cir. 1986) this court held that the trial court could, in its discretion, allow into evidence a reference that was not disclosed at least thirty days in advance despite Section 282, for in that case it was clear that the patentee was not surprised and was not prejudiced:

The objective of section 282's provision for advance notice is to prevent unfair and prejudicial surprise by the production of unexpected and unprepared-for prior art references at trial. To this end, section 282 is to be read with the Federal Rules of Civil Procedure.

790 F.2d at 879, 229 USPQ at 672 (citations omitted). The purpose of Section 282, like that of the Federal Rules, is to prevent unfair and prejudicial surprise, not to facilitate last-minute production of evidence. The district court in the instant case was well within its discretion in excluding the Munters patent, for the record shows that Lydall offered no reason to justify its submission long after the close of discovery. The solid entrenchment of the Federal Rules and the principles of orderly discovery weigh heavily against Lydall's argument that Section 282 governs the requirement of notice of prior art despite

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the elaborate discovery procedures, interrogatories, and explicit directives by which the trial was managed.

Costs

Costs are taxed against Lydall. See Fed.R.App.P. 39; Fed.Cir.R. 39.

AFFIRMED-IN-PART and REVERSED-IN-PART .

Clevenger, J., concurring in part and dissenting in part.

I agree with the conclusions that the claims in suit are not infringed, either literally or by equivalents, and are not invalid for anticipation or obviousness. I also agree that the claims in suit are not unenforceable for inequitable conduct, and that no error infects the challenged evidentiary rulings. I write separately to indicate a few points of disagreement as to the path followed by the court to the conclusions, and to highlight the point that the claim interpretation, with which I agree, drives both of the infringement conclusions.

There is no infringement in this case because the accused devices lack embossments that make contact with and separate adjacent foil layers. The claims recite "embossments therein separating said layers . . ." The claim language itself does not speak of point contact. Separation by point contact, as the court's opinion amply demonstrates, is emphasized in the written description. The claim term "embossments" is thus properly understood to require the function of separation by point contact.

The claim interpretation analysis in this case follows from our recent decision in *Vehicular Technologies Corp. v. Titan Wheel Int'l, Inc.* , 141 F.3d 1084, 46 USPQ2d 1237 (Fed.Cir. 1998). In that case, the key claim language called for two concentric springs in a spring assembly, and the written description clearly required that the second spring have a back-up spring function. We held in *Vehicular Technologies* that the back-up function of the second spring affects the range of equivalents available to the patentee. *Id.* at 1091. So it is in this case, as well. Here, the same claim interpretation analysis requires the embossments to function by point contact, a claim requirement that likewise affects the range of equivalents. Because of this analysis, no reasonable juror could find infringement of claim 1 of the '743 patent under the doctrine of equivalents. As the court notes, the jury deadlocked on that infringement question. The issue was preserved below by post-verdict motions for judgment as a matter of law, and ATD preserves the issue on appeal by challenging the denial of its motion for a new trial on the question of infringement by equivalents.

We need not remand the deadlocked equivalents issue, however, because the claim as interpreted requires point contact to achieve separation of the layers. A claim of infringement by equivalents cannot succeed unless each limitation of a claim is met by an equivalent. *Warner-Jenkinson Co. v. Hilton Davis Chem. Co.* , 520 U.S. 17, 41 USPQ2d 1865 (1997) (adopting sub silentio the "all elements" rule of *Pennwalt Corp. v. Durand-Wayland, Inc.* , 833 F.2d 931, 225 USPQ2d 552 (Fed.Cir. 1987) (*in banc*)). Because the accused devices lack any equivalent to the function of point contact, they cannot infringe

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claim 1 as a matter of law. See *Vehicular Technologies* 141 F.3d at 1090.

With regard to the issue of inequitable conduct, the district court made no explicit ruling on the materiality of the allegedly nondisclosed matter. *ATD Corp. v Lydall, Inc.* , No. 94-CV-74320, slip op. at 43-46 (E.D. Mich. Jan. 9, 1995) (Opinion and Order Regarding Motions for Summary Judgment). Instead, the district court hinged its decision on the absence of proof of the requisite intent to deceive. *Id.* I thus would not dwell on the issue of materiality, as does the court, but instead would simply affirm the district court decision on its stated ground.

I disagree with the court's view that the district court applied an incorrect standard to test the new trial

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motion. In the opinion and order denying the Rule 59 motion, the trial court set out the same law that this court states is governing. *Compare ATD Corp. v Lydall, Inc.* , 43 USPQ2d 1170, 1173, 1997 WL 111783, *3 (E.D. Mich. 1997) *with* the Maj. Op. at 29-30. The trial court then applied that "correct" law and determined that the alleged improper admission of Lydall's patent did not affect the substantial rights of ATD, because sufficient other evidence was before the jury to sustain its verdict of noninfringement by equivalents. *ATD Corp.* , 43 USPQ2d at 1173-79. In a footnote at the end of the discussion of the issue, the district court's opinion merely comments that even if there had been error in admitting Lydall's patent, the error would have been harmless. *Id.* at 1175 n.6. That comment is unrelated to the correct legal standard that the district court used to decide the Rule 59 motion, and cannot form a predicate for criticism of the district court.

Finally, I do not join the decision to tax costs to Lydall. Although the court speaks harshly of Lydall's conduct at trial, redress for trial court conduct properly lies in the trial court, not here. I am unaware of any reason to impose costs on Lydall.

- End of Case -

RELATED PROCEEDINGS APPENDIX

NONE